

ACS800

Hardware Manual ACS800-104 Inverter Modules



ACS800-104 (1.5 to 2000 kW) Inverter Modules

Hardware Manual

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Introduction to this manual

What this chapter contains

This chapter gives the basic information on the manual.

Compatibility

The manual is compatible with the ACS800-104 inverter modules intended for user-defined cabinet installations.

Safety instructions

Follow all safety instructions delivered with the drive.

Intended audience

The reader of the manual is expected to know the standard electrical wiring practices, electronic components, and electrical schematic symbols.

Contents

- *Hardware description*
- *Cabinet construction*
- *Electrical installation*
- *External +24 V power supply for the RMIO board (Frames R2i to R5i)*
- *Installation checklist*
- *Motor control and I/O board (RMIO)*
- *Maintenance*
- *ACS800-104 ordering information*
- *Technical data*
- *Circuit diagrams*
- *Dimension drawings.*

Related publications

- *ACS800 MultiDrive Safety Instructions* (3AFE64760432 [English])
- *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE64783742 [English])
- *ACS800 MultiDrive Modules; Planning the Cabinet Installation* (3AFE64783572 [English])
- *ACS800-304 and ACS800-704 Diode Supply Units User's Manual* (3AFE64494023 [English])
- *ACS800 Multidrive Modules Product Reference* (3AFE64813340 [English]). Contains descriptions of ACS800 drive products and information on generic options
- Firmware manuals
- Option-specific manuals.

Terms and abbreviations

Term/ Abbreviation	Explanation
AGPS	Gate driver Power Supply board. An optional board within inverter modules used to implement the Prevention of Unexpected Start function.
APBU (or NDBU)	Types of optical branching unit used for connecting parallel-connected inverter modules to the RDCU.
CMF	Common mode filtering.
DDCS	Distributed Drives Communication System; a protocol used in optical fibre communication inside and between ABB drives.
Drive unit	See Inverter unit.
DSU	Diode supply unit (consisting of one or more diode supply modules).
DTC	Direct Torque Control.
EMC	Electromagnetic Compatibility.
Frame (size)	Relates to the construction type of the component in question. For example, several supply modules with different nominal powers may have the same basic construction. The term is often used in reference to a group of components that share a similar mechanical construction. To determine the frame size of a component, refer to the rating tables in chapter <i>Technical data</i> .
IGBT	Insulated Gate Bipolar Transistor; a voltage-controlled semiconductor type widely used in inverters due to their easy controllability and high switching frequency.
Inverter unit	An entity containing all inverter modules controlling a motor, together with their control electronics, and I/O and auxiliary components.
I/O	Input/Output.
NDBU	Types of optical branching unit for fibre links between the drive control unit and the inverter modules.
PLC	Programmable Logic Controller.
PPCS	Power Plate Communication System; a protocol used in the optical fibre link that controls the output semiconductors of an inverter module.
RDCU	Drive control unit. The RDCU is a separate unit consisting of an RMIO board built in a plastic housing. Module sizes R2i to R5i have the RMIO board built-in.
RFI	Radio-Frequency Interference.
RMIO	Motor control and I/O board. Contains the principal inputs and outputs of the drive. Module sizes R2i to R5i have the RMIO board built-in; with larger units, the RMIO is contained within a separate RDCU drive control unit.
THD	Total Harmonic Distortion

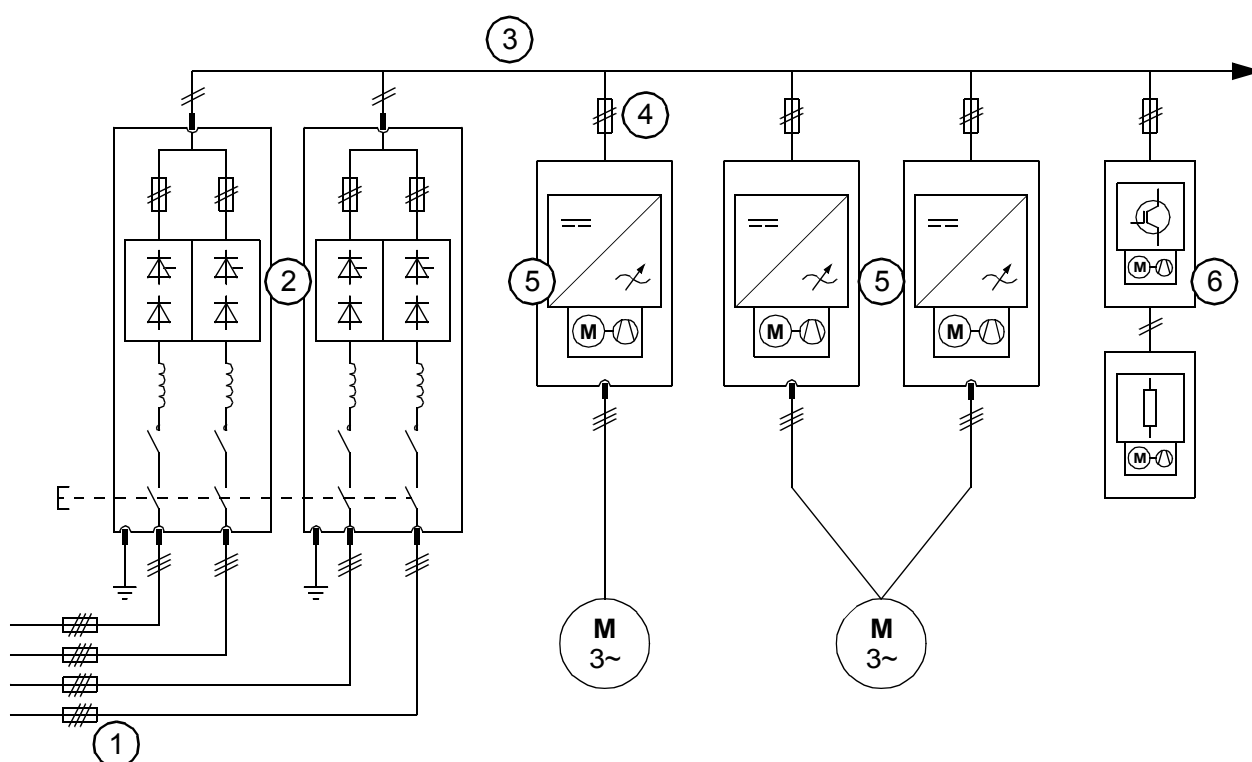
Hardware description

What this chapter contains

This chapter describes a typical drive system and the hardware of the inverter modules. The information is valid for all ACS800-104 inverter modules.

Typical drive system

The diagram below depicts a common DC bus drive system.



- 1 – Input (AC) fuses
- 2 – Supply unit (in this example, consisting of two supply modules)
- 3 – DC bus
- 4 – Inverter DC fuses
- 5 – Inverter units (in this example, one of the units consists of two inverter modules connected in parallel)
- 6 – Brake chopper(s) (optional)

Inverter module hardware

The ACS800-104 range of inverter modules contains components for building the inverter unit(s) of a common DC bus system drive.

The chapter *ACS800-104 ordering information* lists the order codes of the inverter module components. See also the *Dimension drawings* for dimensions of the modules and related equipment.

The section *Control interfaces* below shows the available control and I/O options.

The ACS800-104 inverter modules have coated circuit boards as standard. A Prevention of Unexpected Start feature is optionally available, consisting of a built-in AGPS board.

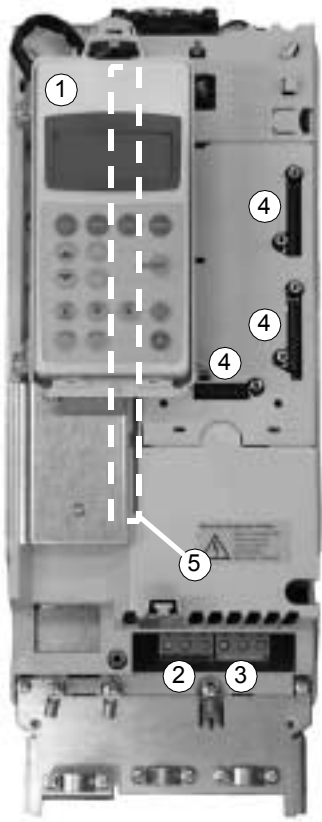
Frames R2i to R5i

The DC input and motor output cables are connected to screw terminal blocks at the bottom of the module, covered by a metal housing.

Frame R2i to R5i modules do not require an external charging circuit.

External du/dt filters are available; see the chapter *ACS800-104 ordering information*.

Module layout (Frame size R3i pictured)

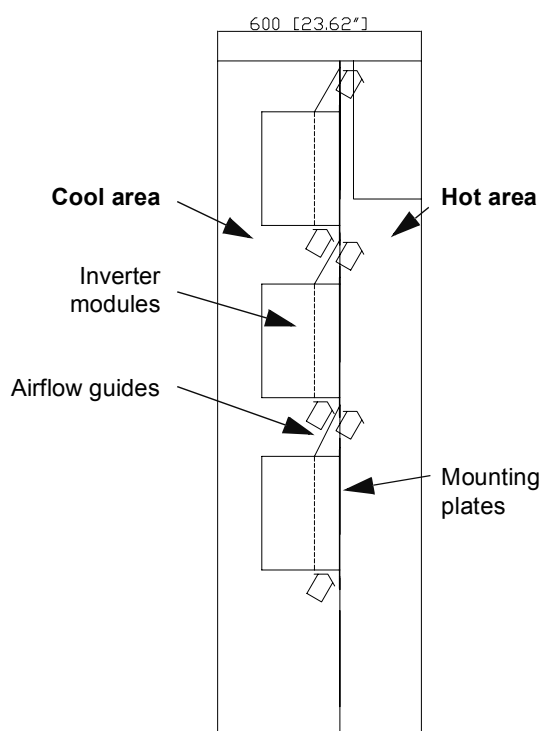


Item	Explanation
1	Control panel mounting platform and CDP 312R control panel (optional). Can be turned aside.
2	DC (input) connections
3	Motor (output) connection
4	Slots for optional I/O modules
5	I/O terminal blocks on RMIO (obscured)

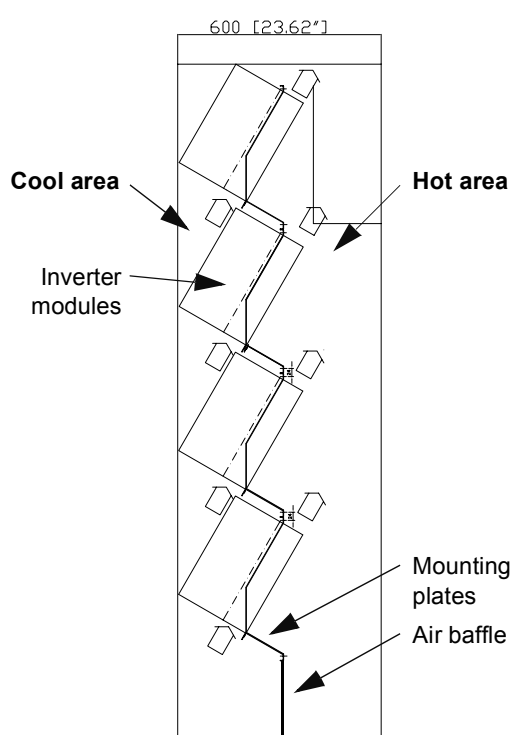
Cabinet layout

Several modules can be installed in one cubicle. The modules can be mounted vertically, or in a slightly inclined position to save more vertical space. See the chapter *Cabinet construction*. Drawings of mounting accessories for both vertical and inclined mounting, suitable for common cabinet systems, are shown under *Dimension drawings*. (The plates for inclined mounting can be ordered from ABB.)

Vertical mounting



Inclined mounting



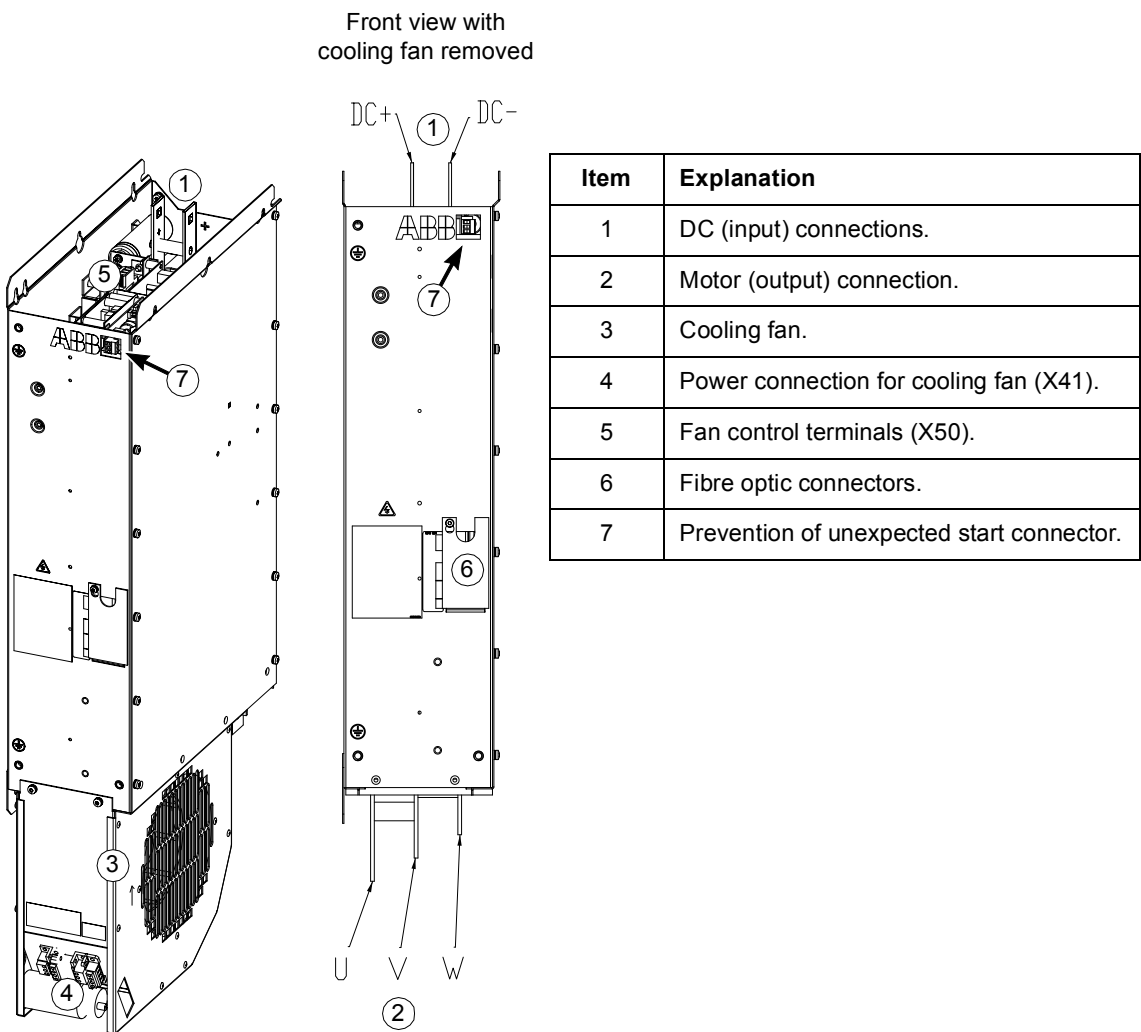
Frame R7i

The frame R7i module has the DC input connection at the top, while the AC connection is at the bottom. The DC voltage is connected to the input busbars either through fuses only or through a switch fuse. If a switch fuse is to be used, the module must be equipped with an internal charging circuit (option code +F272).

The drive control unit (type RDCU) containing the RMIO board is to be installed separately.

The modules can be ordered with a 230 V (50 Hz) or 115 V AC (60 Hz) cooling fan depending on the desired auxiliary voltage.

Module layout



Cabinet layout

See the chapter *Cabinet construction*.

Frame R8i and multiples

Frame R8i modules are used to achieve output powers from approximately 200 kW upwards in single or parallel configurations. R8i modules run on wheels, and can easily be removed from the cubicle for cable installation or service.

The DC input is located on the top front part of the module. The DC voltage is connected to the input busbars either through fuses only or through a switch fuse with charging control circuitry. Common mode filtering is implemented by running the DC busbars through ferrite cores (optionally available).

The motor connection is via a quick connector at the back of the module that couples when the module is inserted into the cubicle. From the connector, the cables can be run directly through the bottom plate of the cubicle. Each parallel module is cabled separately to the motor, or connected to a common output cubicle by busbars or cables of equal length.

The modules are available with either an internally-supplied, speed-controlled fan, or a fan supplied from an external three-phase (400 V 50 Hz or 320 V 60 Hz) source. Internal du/dt filters are also available. For information on whether du/dt filtering is necessary, see the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742 [English]). (du/dt filtering must be selected if a common motor terminal cubicle is used. See the chapter *Electrical installation*.)

The drive control unit (type RDCU) containing the RMIO board is to be installed separately.

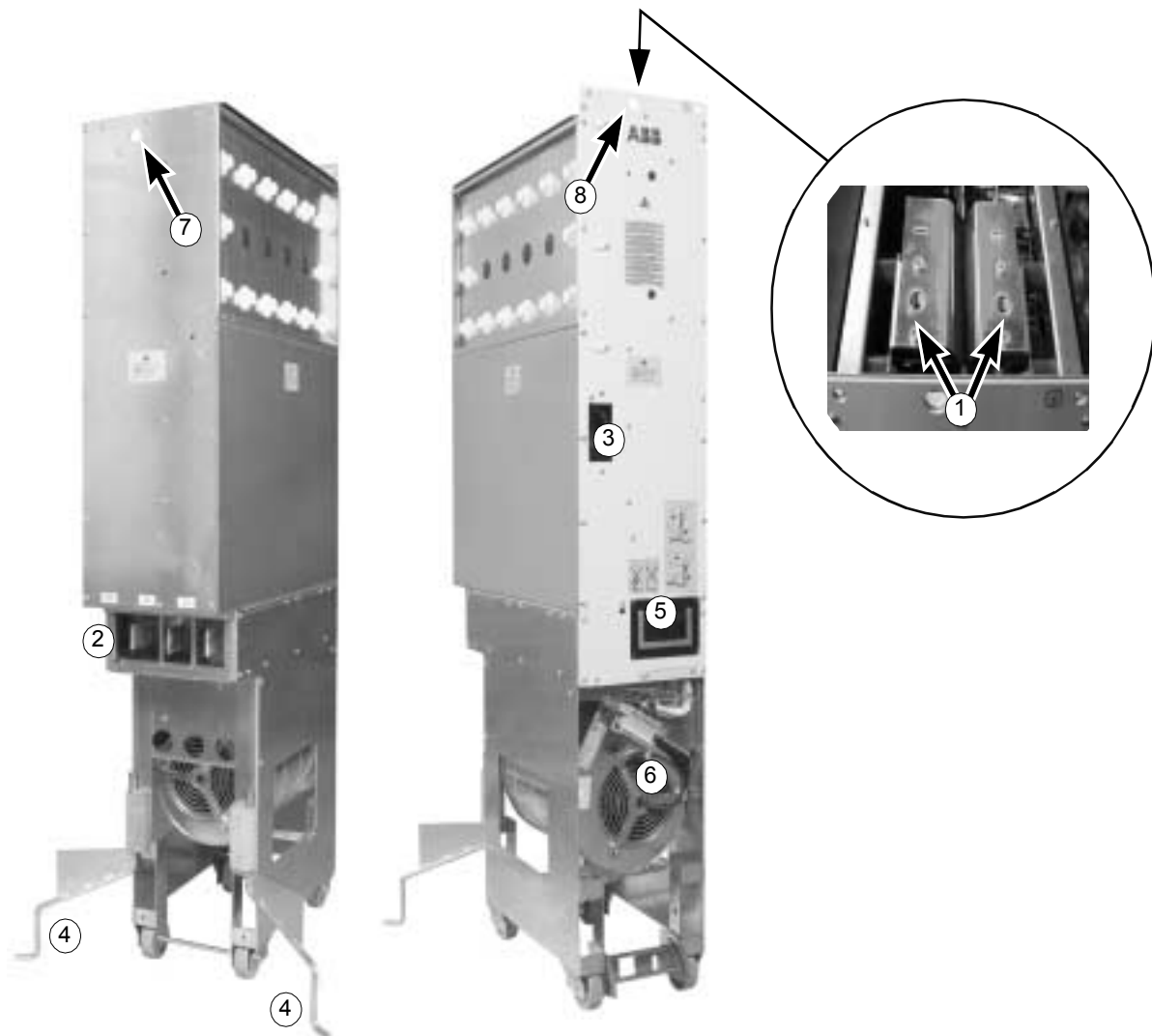
Reduced run capability

If one of two or more parallel-connected modules fails, the drive can continue to be run at reduced power using the remaining modules. See page 100 for information on utilising this feature.

Cooling fan

The cooling fan at the base of the inverter module is usually fed from the auxiliary voltage supply of the cabinet. A speed-controlled fan is optionally available, involving an additional power supply board and a fan inverter board that outputs a frequency in the range of 5 to 55 Hz to the fan. The fan is regulated according to the temperature of the output stage of the module. Through drive parameters, other operating modes, such as constant speed, may also be available; see the appropriate *Firmware Manual* delivered with the drive.

Module layout



Item	Explanation
1	DC (input) connections
2	Output busbars. To be aligned with the quick connector socket mounted in the cubicle. Direct connection of cables without using the quick connector is also possible.
3	Fibre optic connectors of the AINT board. Connected to the RDCU drive control unit (via an NPBU branching unit in case of parallel inverter modules).
4	Retractable support legs
5	Handle
6	Cooling fan
7, 8	Lifting points

Cabinet layout

Inverter modules can be installed side by side. The DC fuses and/or switch fuse are to be installed above the modules. The control electronics (RDCU control unit, PPCS branching unit [for parallel modules only], relays and other auxiliary voltage equipment) are to be installed in a separate cubicle. See examples in the chapter *Cabinet construction*.

Using the quick connectors at the motor output enables quick replacement of a module for maintenance, even though direct connection of cables to the module output is also possible.

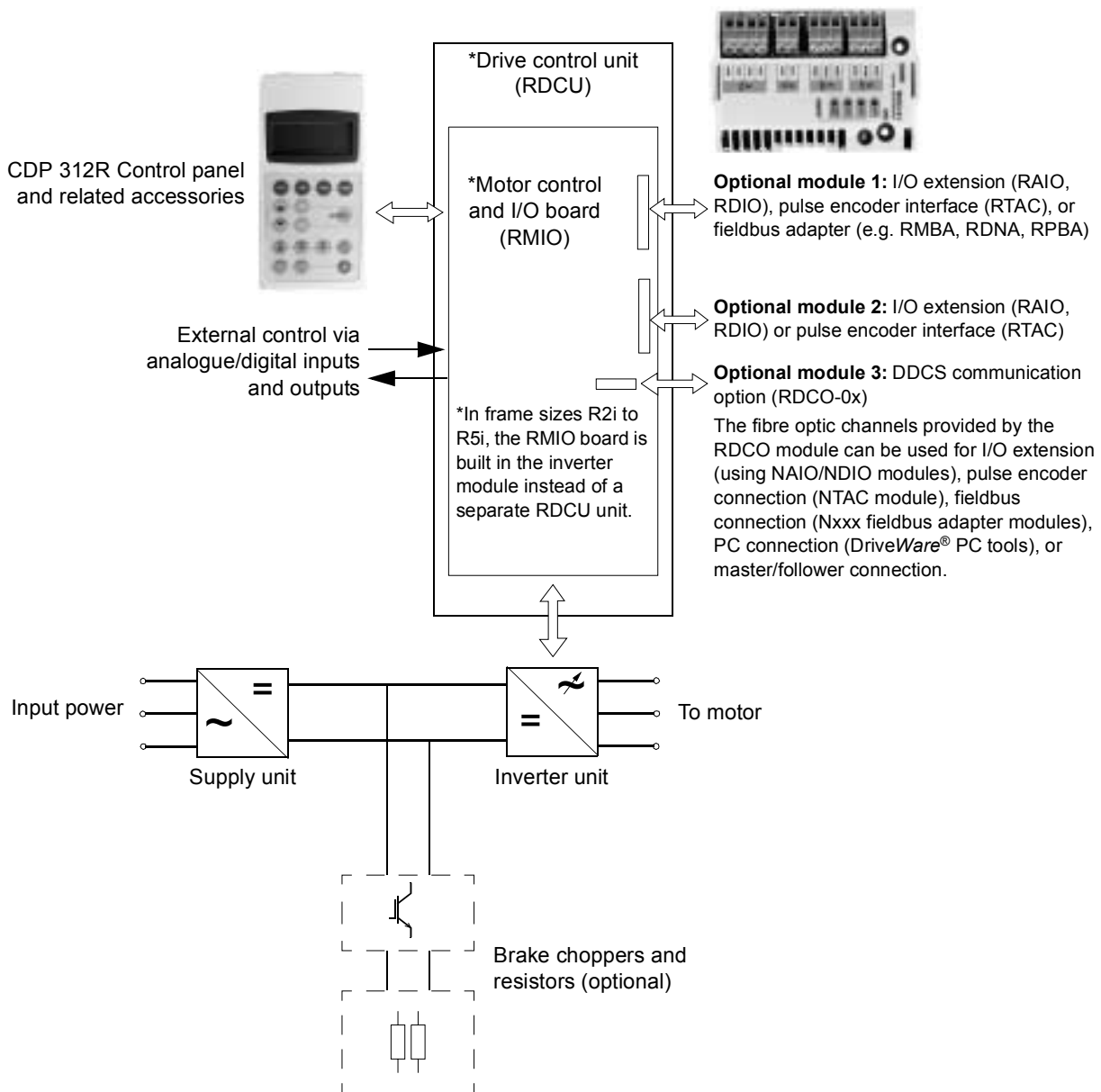
Control interfaces

The following diagram shows the control interfaces and I/O options of the inverter unit.

The front cover of frame R5i has a platform for the CDP 312R control panel; frames R2i to R4i require an additional platform kit if the panel needs to be mounted on the module.

For frame R7i to R8i (and multiples), the control panel is to be installed on a door platform, available as a separate kit.

See the chapter *Electrical installation* for more information.



Type code

Each module has a type designation label attached, containing e.g. the type code of the unit. The type code contains information on the specifications and configuration of the unit.

- The first 17 digits form the basic code. It describes the basic construction of the unit. The fields in the basic code are separated with hyphens.
- The option codes follow the basic code. Each option code starts with an identifying letter (common for the whole product series), followed by descriptive digits. The option codes are separated by plus signs.

The main selections are described below. Not all options are necessarily available for all types. For more information, contact your local ABB representative.

Basic code

Digit no.	Name/Description	Alternatives	Description
1...6	Product series	ACS800	
8...10	Construction	104	Inverter module
12...14	Size	0003 and up	3 kVA and up
16	Voltage rating	3	380/400/415 V. Nominal voltage: 400 V.
		5	380/400/415/440/460/480/500 V. Nominal voltage: 500 V.
		7	525/575/600/660/690 V. Nominal voltage: 690 V.

Option codes

Ident. letter	Name/Description	Alternatives	Description
C		+C126	Speed-controlled cooling fan supplied from the DC bus. Frame R8i only.
E	Filters	+E205	Internal output (du/dt) filters. Frame R8i only.
F		+F272	Internal charging circuit. To be used with a DC fuse switch. Frame R7i only.
G	Control voltage	+G304	115 V AC control voltage. Frame R7i only.
P	Protection class	+P901	Coated circuit boards. This feature is standard.
Q	Safety features	+Q950	Prevention of unexpected start (built-in AGPS board).

Cabinet construction

What this chapter contains

This chapter contains instructions for constructing the cabinet for ACS800-104 inverter units.

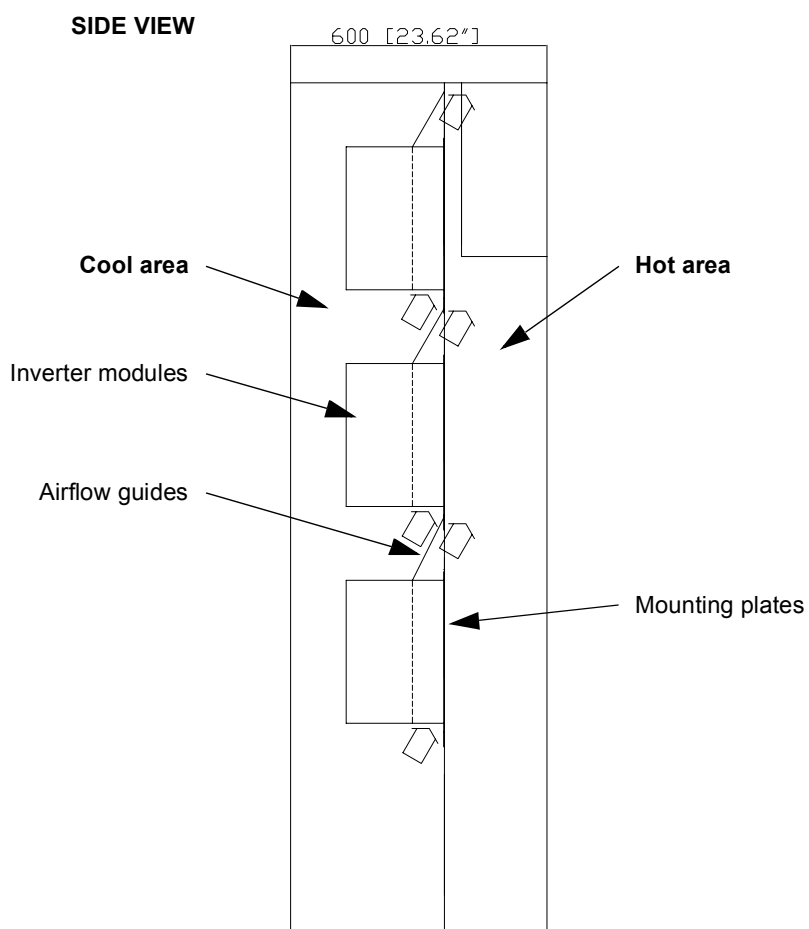
Also refer to the document *ACS800 MultiDrive Modules; Planning the Cabinet Installation* (3AFE64783572 [English]).

Note: The installation must always be designed and made according to applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations. Furthermore, if the recommendations given by ABB are not followed, the drive may experience problems that the warranty does not cover.

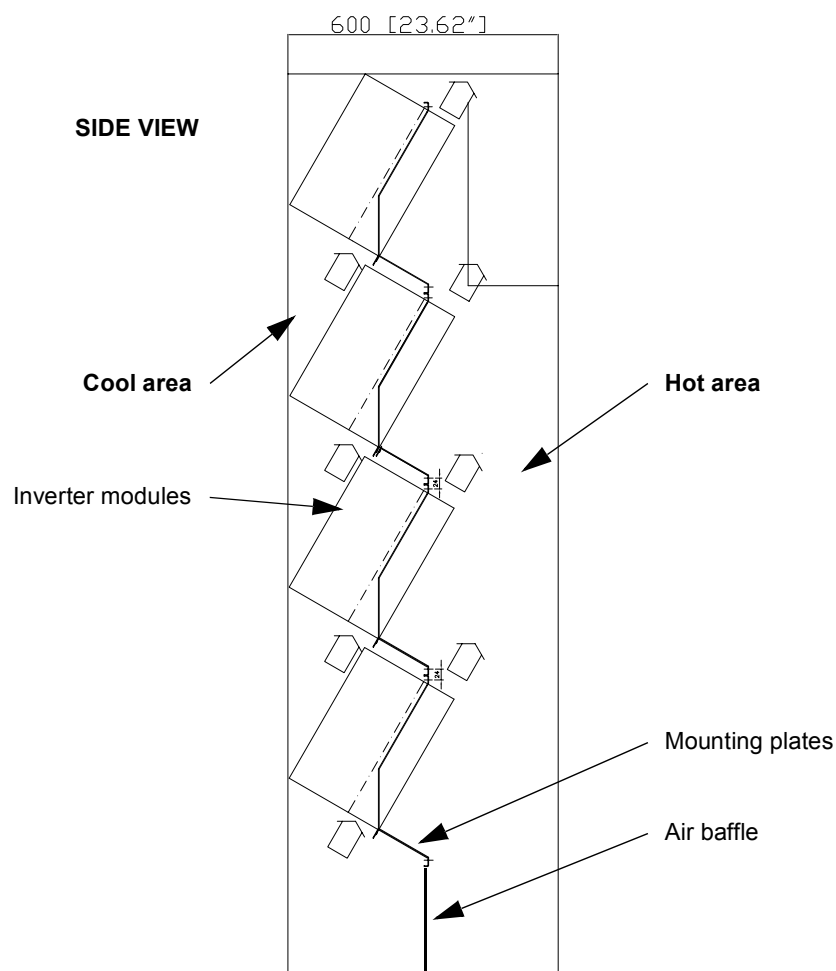
Frame R2i to R5i

Guiding the cooling air flow

The hot air from an inverter module must not be allowed to enter another module. In a cubicle with multiple modules, a practical way of achieving this is to install a mounting plate to separate the cool area (at the front part of the cubicle) from the hot area (back part). The mounting plate can be fastened to two vertical pillars on both left and right. Since the air outlet at the top of the modules points directly upwards, the air must be guided to the hot area. See the example below.



To save vertical space, the inverter modules can be mounted by their flanges in an inclined position as exemplified below.

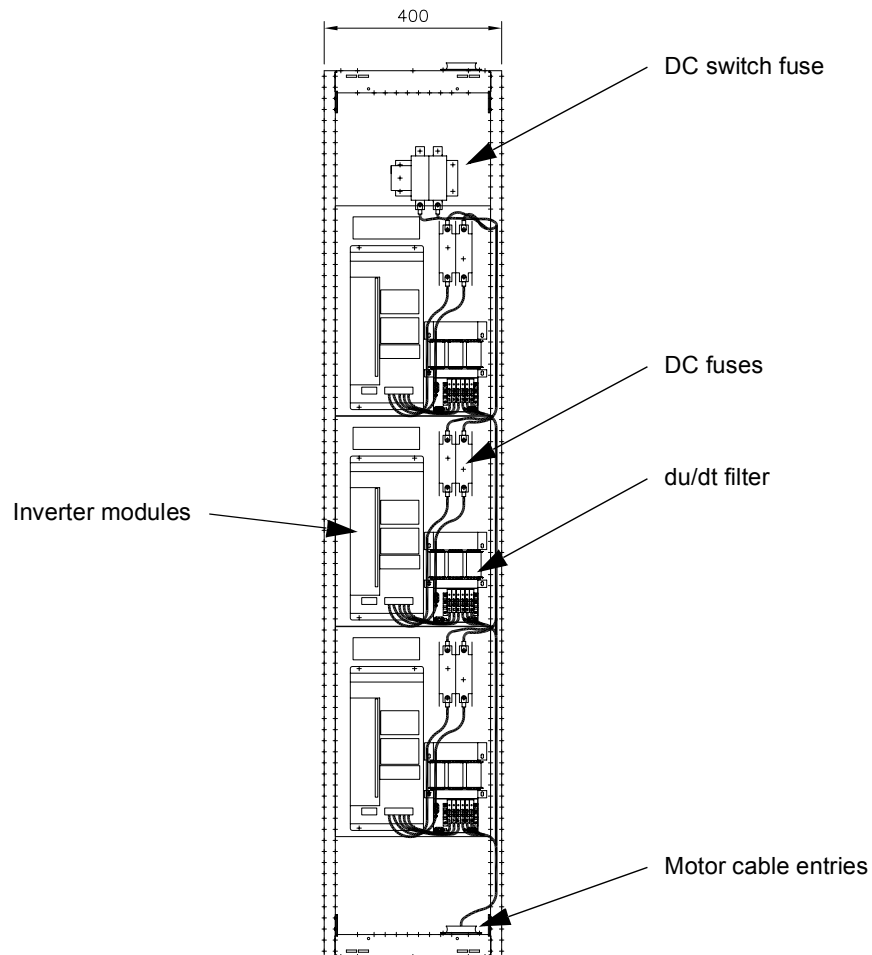


Dimension drawings of the mounting plates are available from ABB by request.

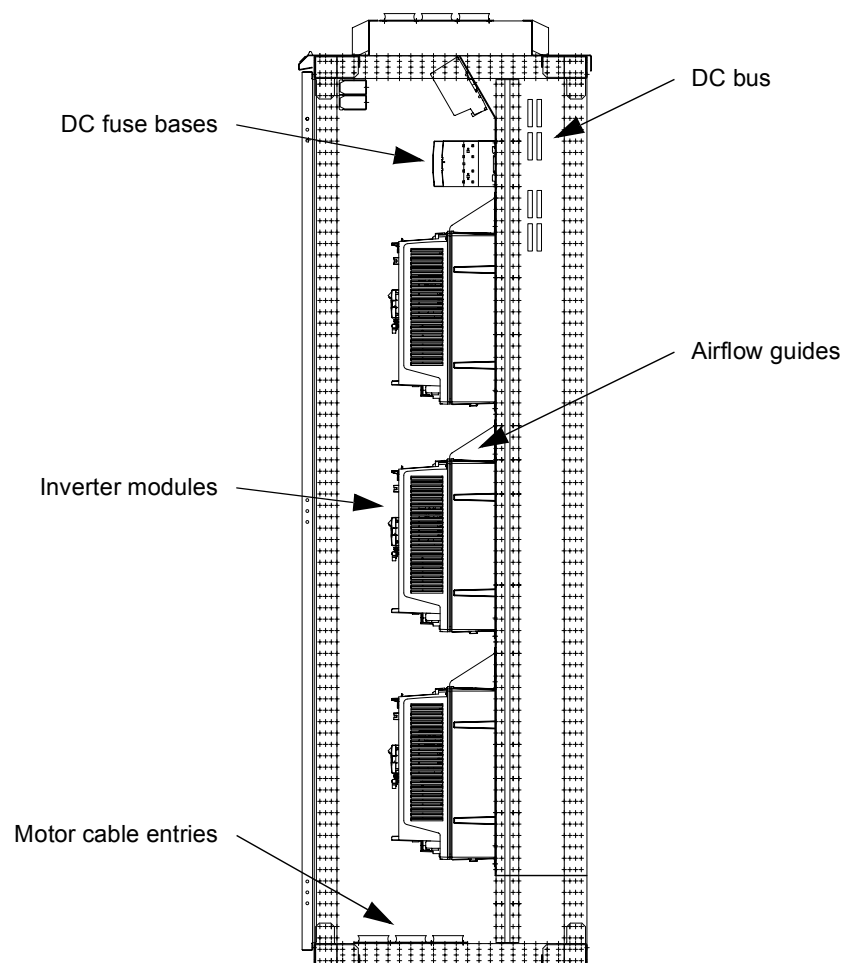
The mounting plates are directly mountable in a 400 mm-wide Rittal TS 8 cabinet system; the outer dimensions and fastening holes can easily be adapted for another system.

Layout examples

The drawing below is a front view of a cubicle with three R2i modules installed on top of each other.



This drawing is a side view of three R3i modules in a 400 mm-wide cubicle.



Frame R7i

General

See the chapter *Technical data* for module-specific cooling requirements.

Cooling

In a typical cabinet construction, the air inlet is at the bottom of the cabinet, while the outlet is at the top. The inlet may be filtered.

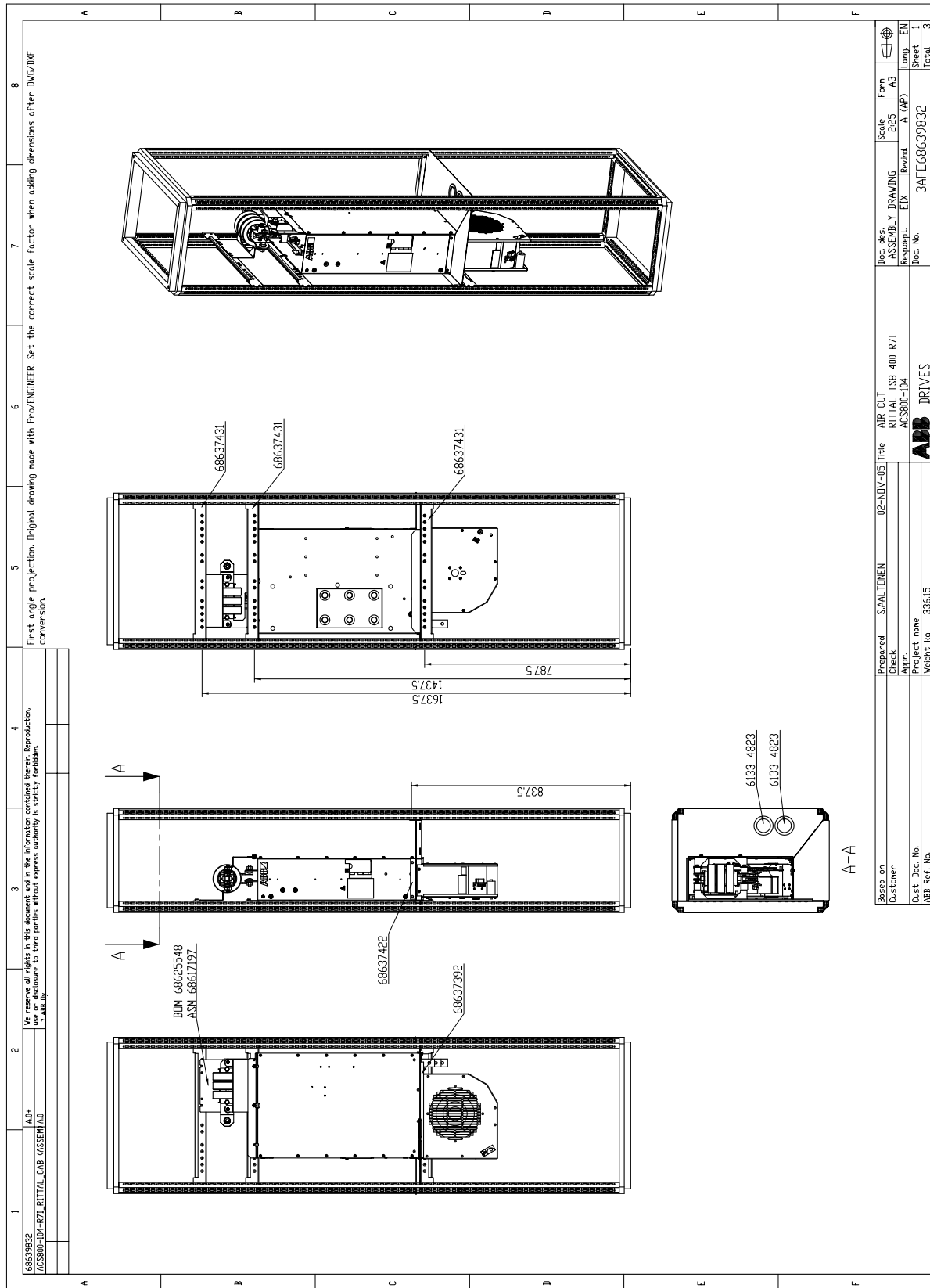
Note: Do not install a filter in the air outlet.

Circulation of air within the cabinet must be prevented. Lateral airflow should be blocked with an air baffle at the bottom of the module. The mounting parts kits available for the R7i module include an air baffle (see the chapter *ACS800-104 ordering information*).

Mounting examples

The following pages contain examples of an R7i module installed on the left and the right in a 400 mm wide Rittal TS 8 cubicle.

LH mounting





Frame R8i and multiples

General

See the chapter Technical data for module-specific cooling requirements.

Cooling

In a typical cabinet construction, the air inlet is at the bottom of the cabinet, while the outlet is at the top, ideally on the roof. The inlet may be filtered.

Note: Do not install a filter in the air outlet.

Circulation of air within the cabinet must be prevented. With R8i inverter modules, lateral airflow should be blocked with a collar-type air baffle at the top of each module. Special attention must be paid to covering the gap between the guide at the top of the module and the side wall of the cubicle.

Module extraction/insertion ramp

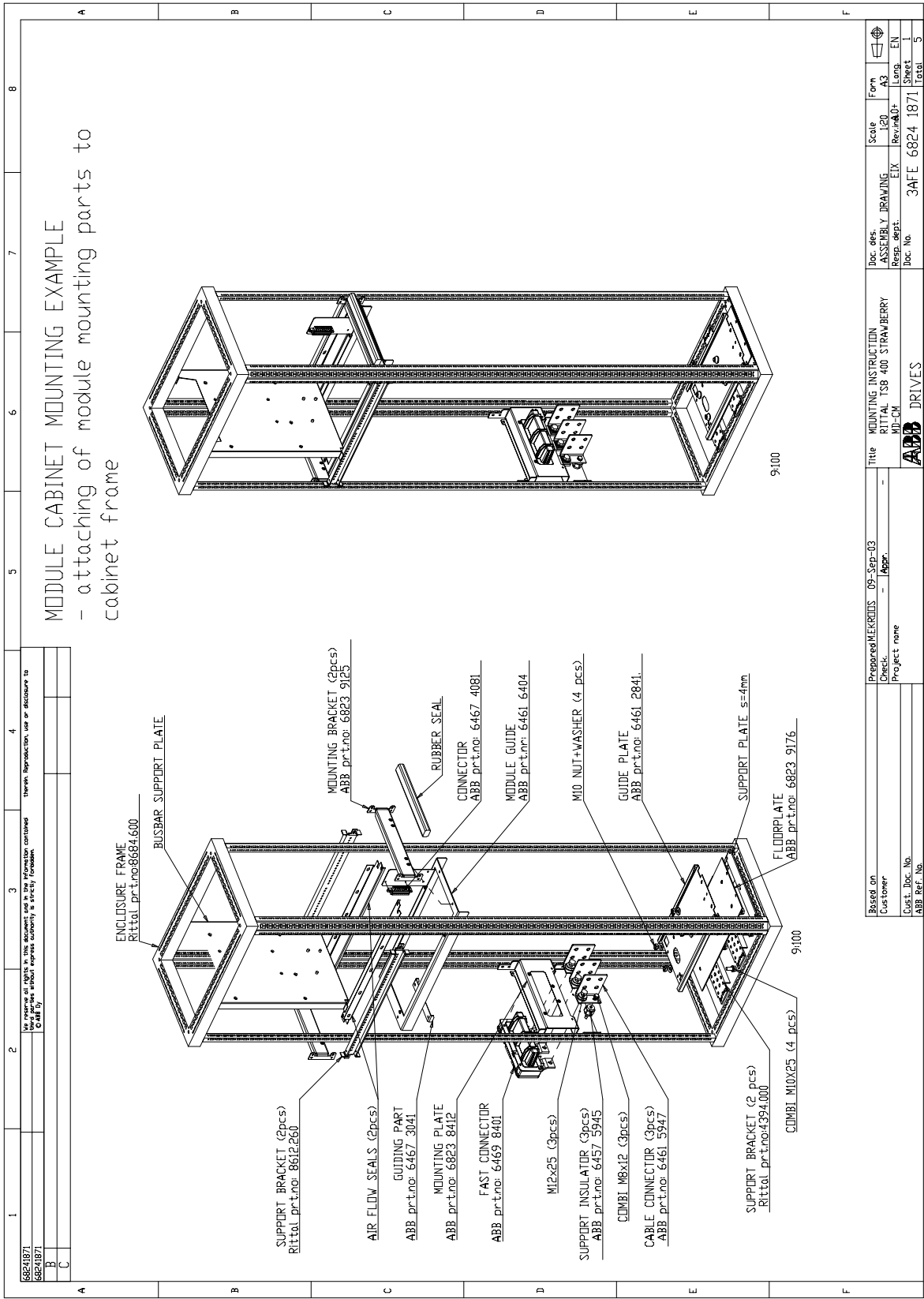
The inverter module is to be inserted into and extracted from the cabinet along a suitable ramp. A dimension drawing of the ramp is available from ABB by request.

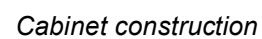
Mounting examples

The following pages contain examples of 1, 2 and 3 R8i modules installed into a Rittal TS 8 cabinet frame. In addition, there is an example of 3 R8i modules installed side-by-side.

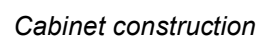
See also the chapter *ACS800-104 ordering information*.

Single R8i module in a Rittal TS 8 cubicle

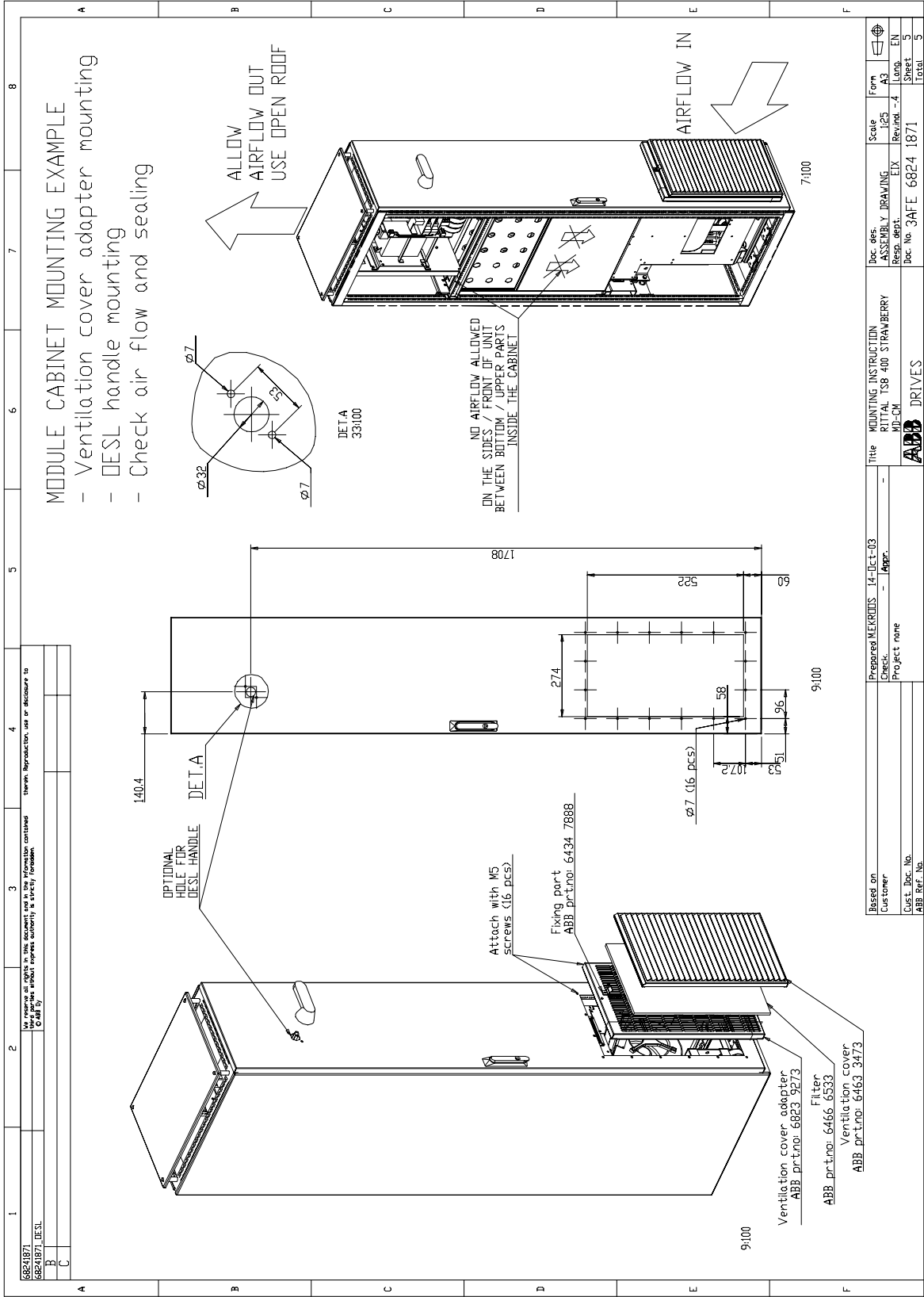






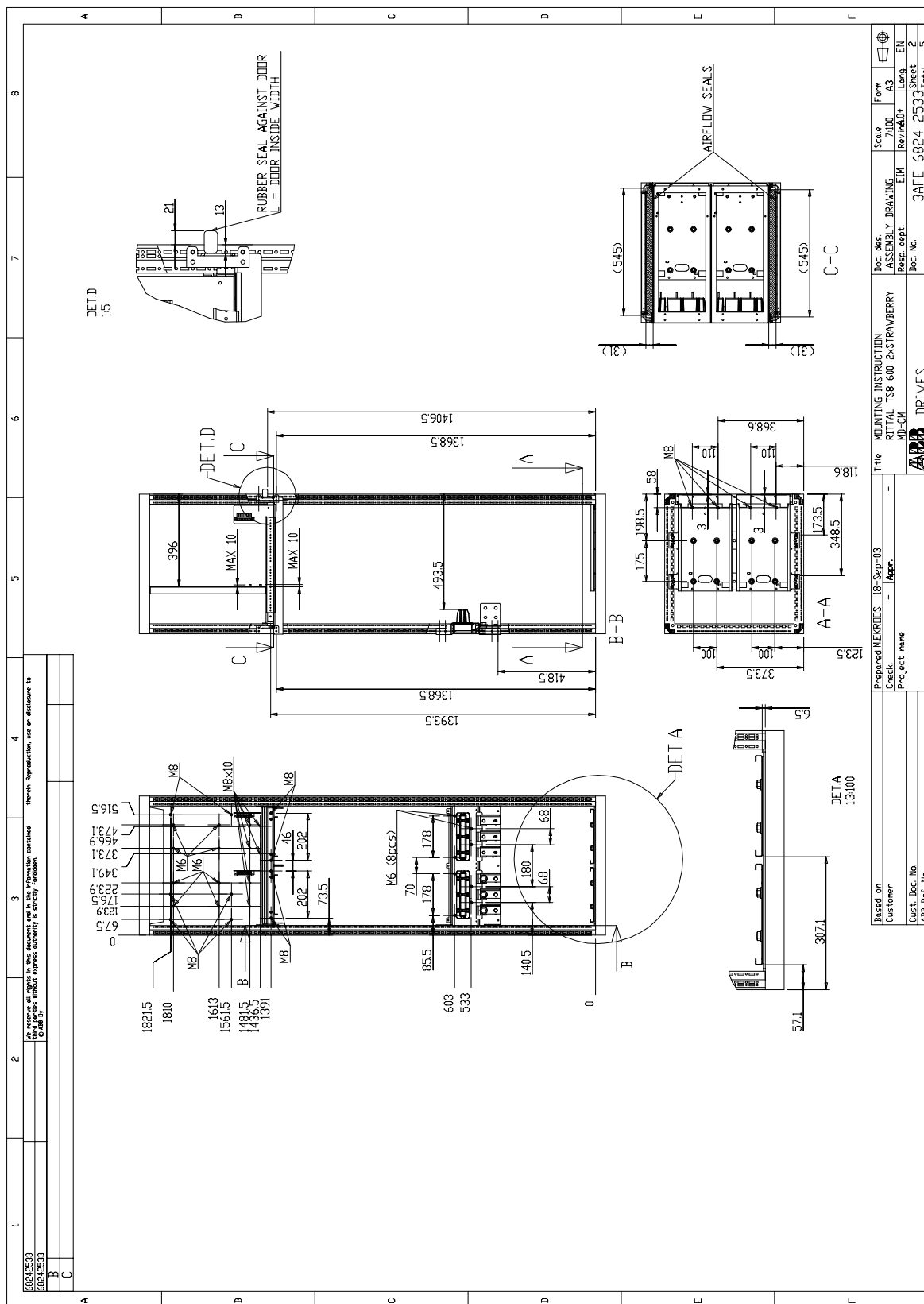


Single R8i module in a Rittal TS 8 cubicle (continued from previous page)

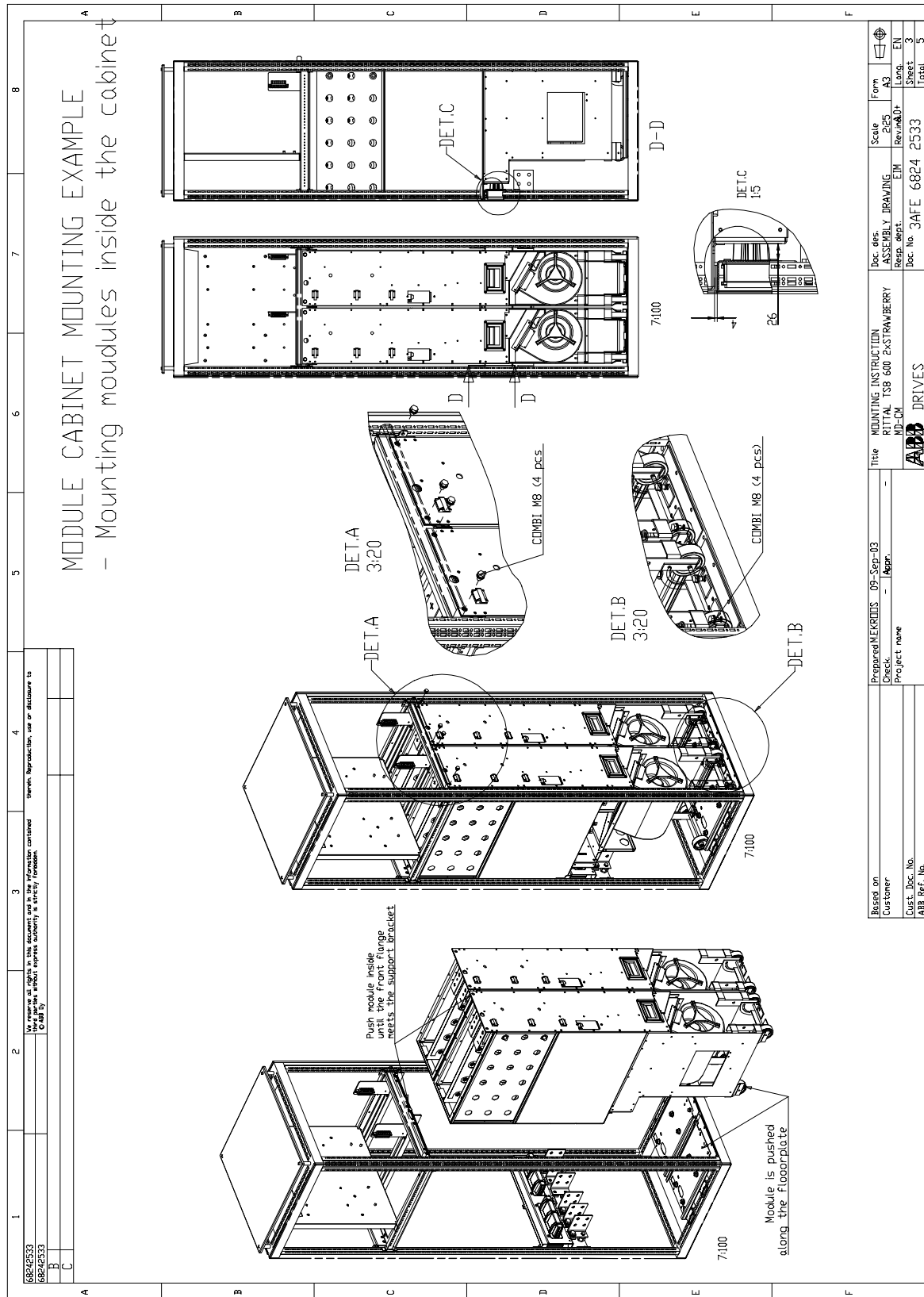




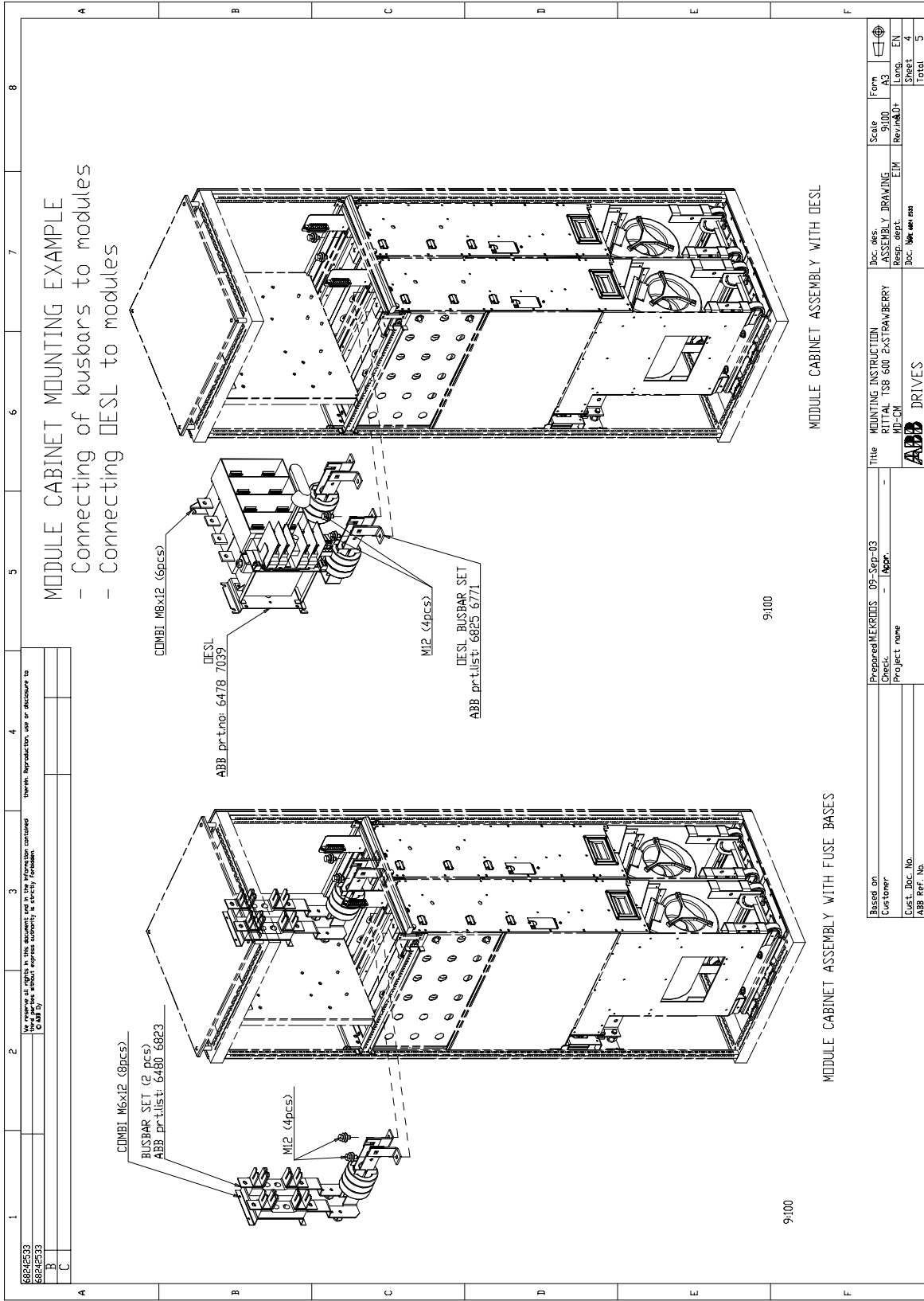
Two R8i modules in a Rittal TS 8 cubicle (continued from previous page)



Two R8i modules in a Rittal TS 8 cubicle (continued from previous page)



Two R8i modules in a Rittal TS 8 cubicle (continued from previous page)

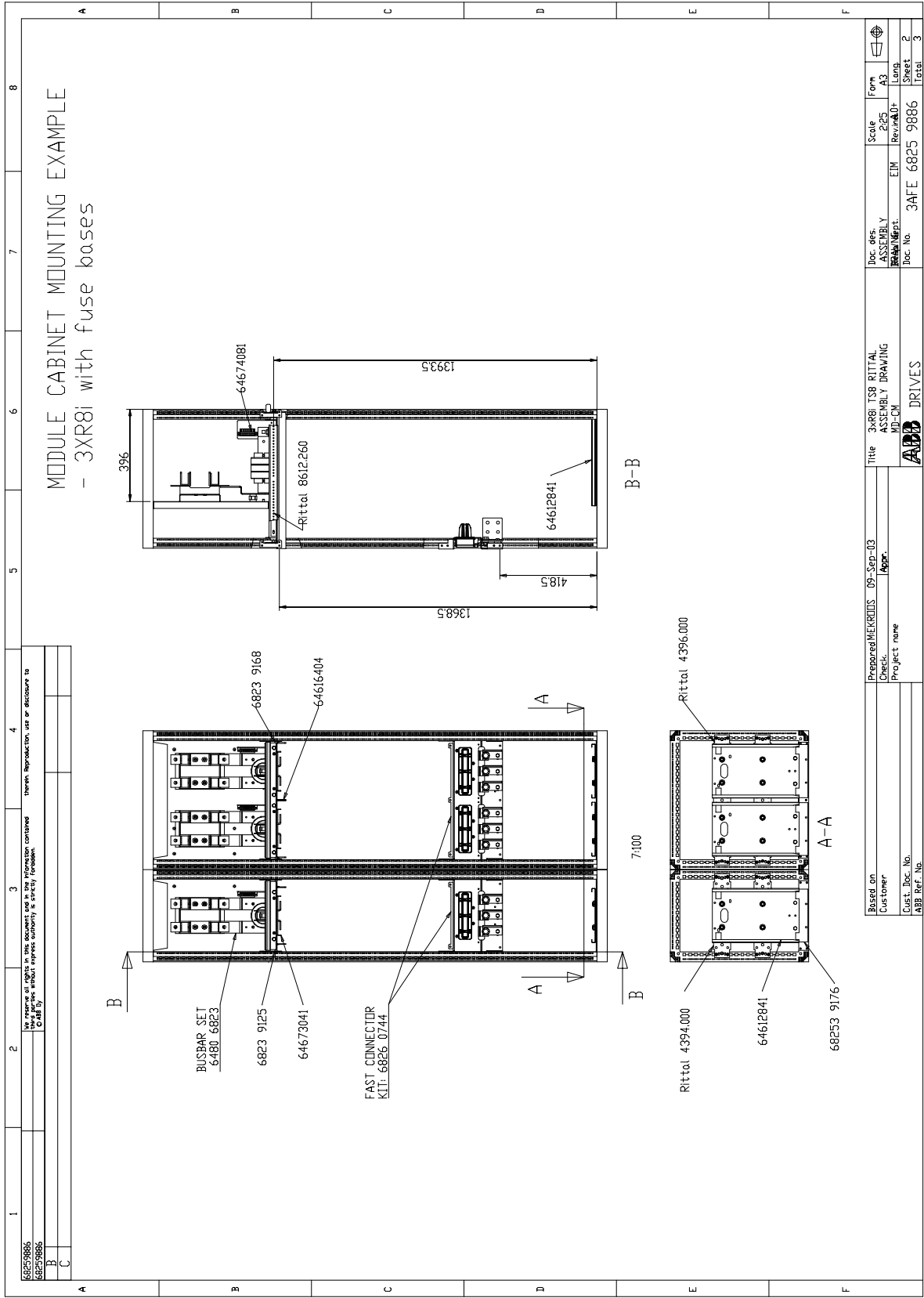




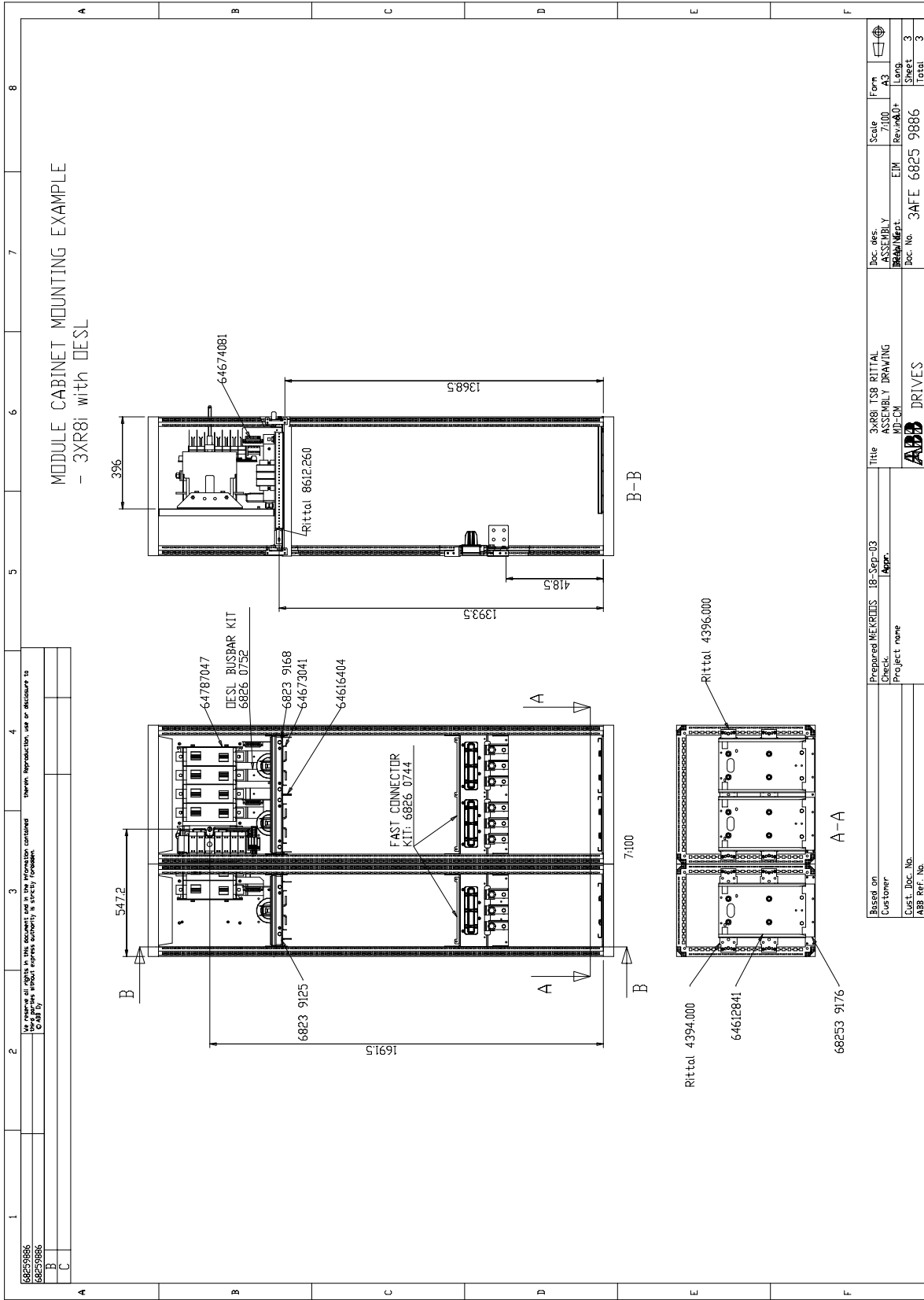
Three R8i modules in a Rittal TS 8 cabinet

Technical drawing of a 3xR8i cabinet showing internal components and mounting options. The drawing includes two views: "MODULES WITH FUSE BASES" and "MODULES WITH DESL". The cabinet is shown in a cutaway view, revealing internal components like fuses, switches, and wiring. The drawing is labeled with dimensions and a scale of 7:100. The title block indicates the drawing is for "3xR8i TS8 RITTAL" and "ASSEMBLY DRAWING".

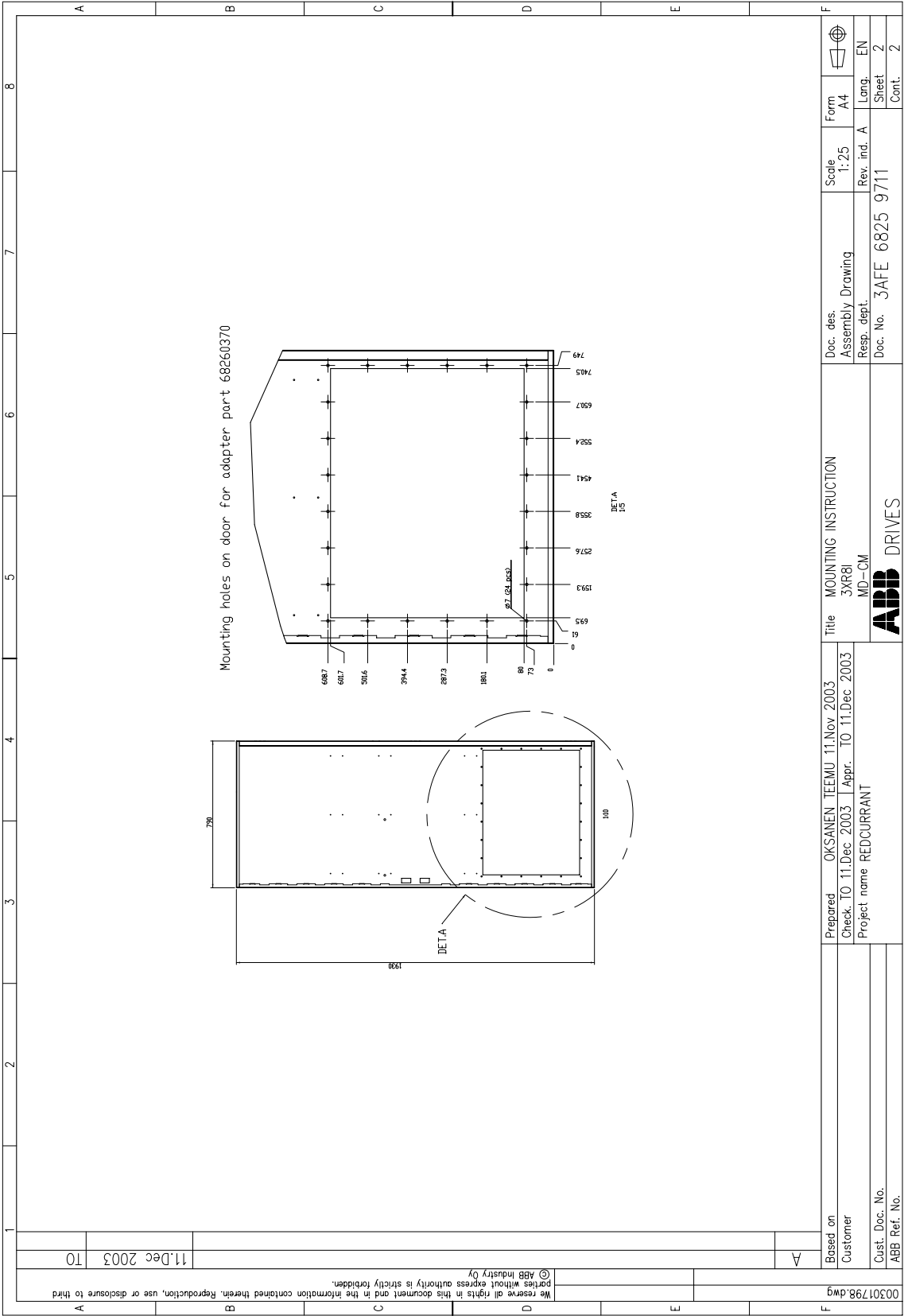
Three R8i modules in a Rittal TS 8 cabinet (continued from previous page)



Three R8i modules in a Rittal TS 8 cabinet (continued from previous page)



Three R8i modules side by side (continued from previous page)



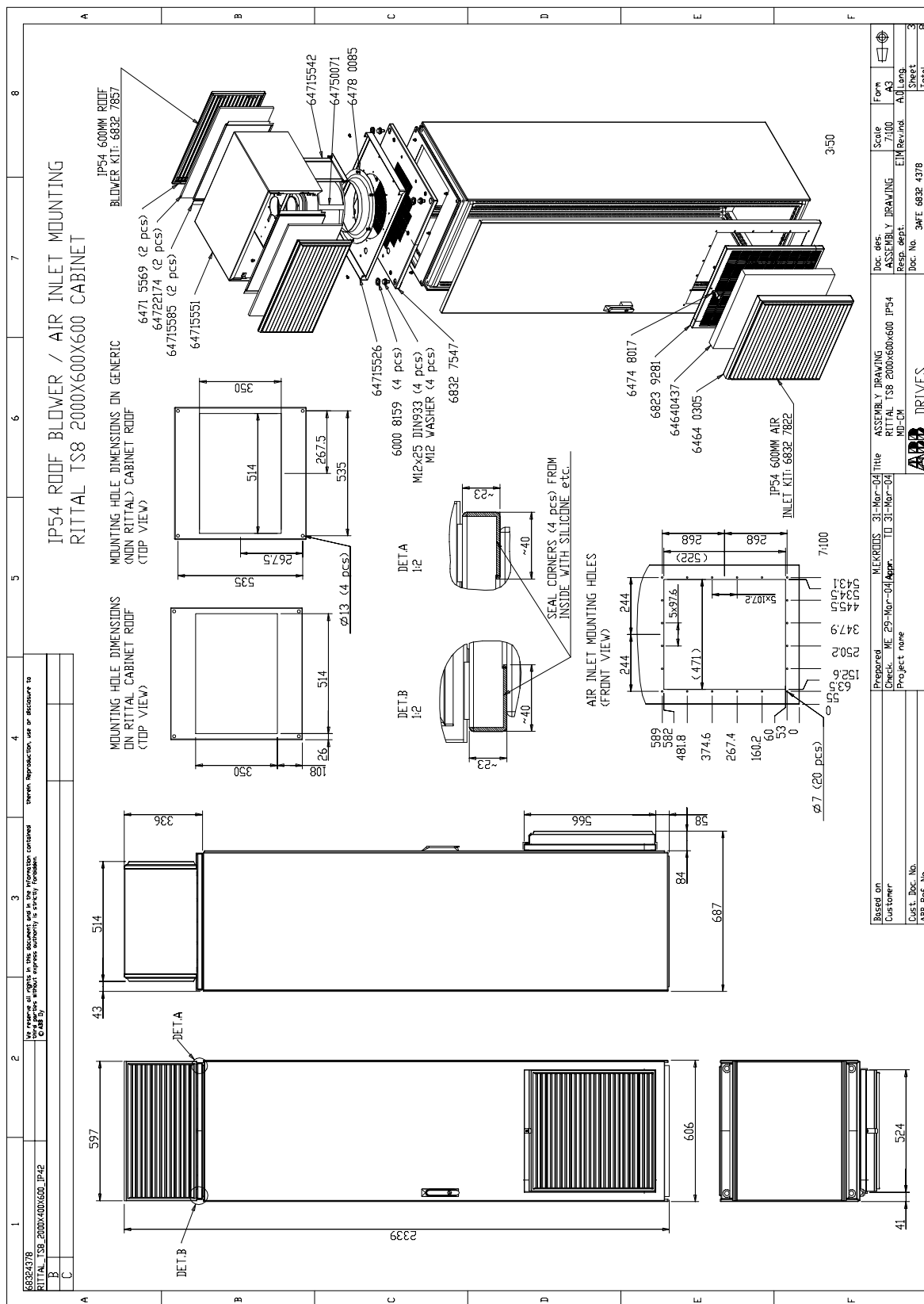
Cabinet ventilation (all frame sizes)

General

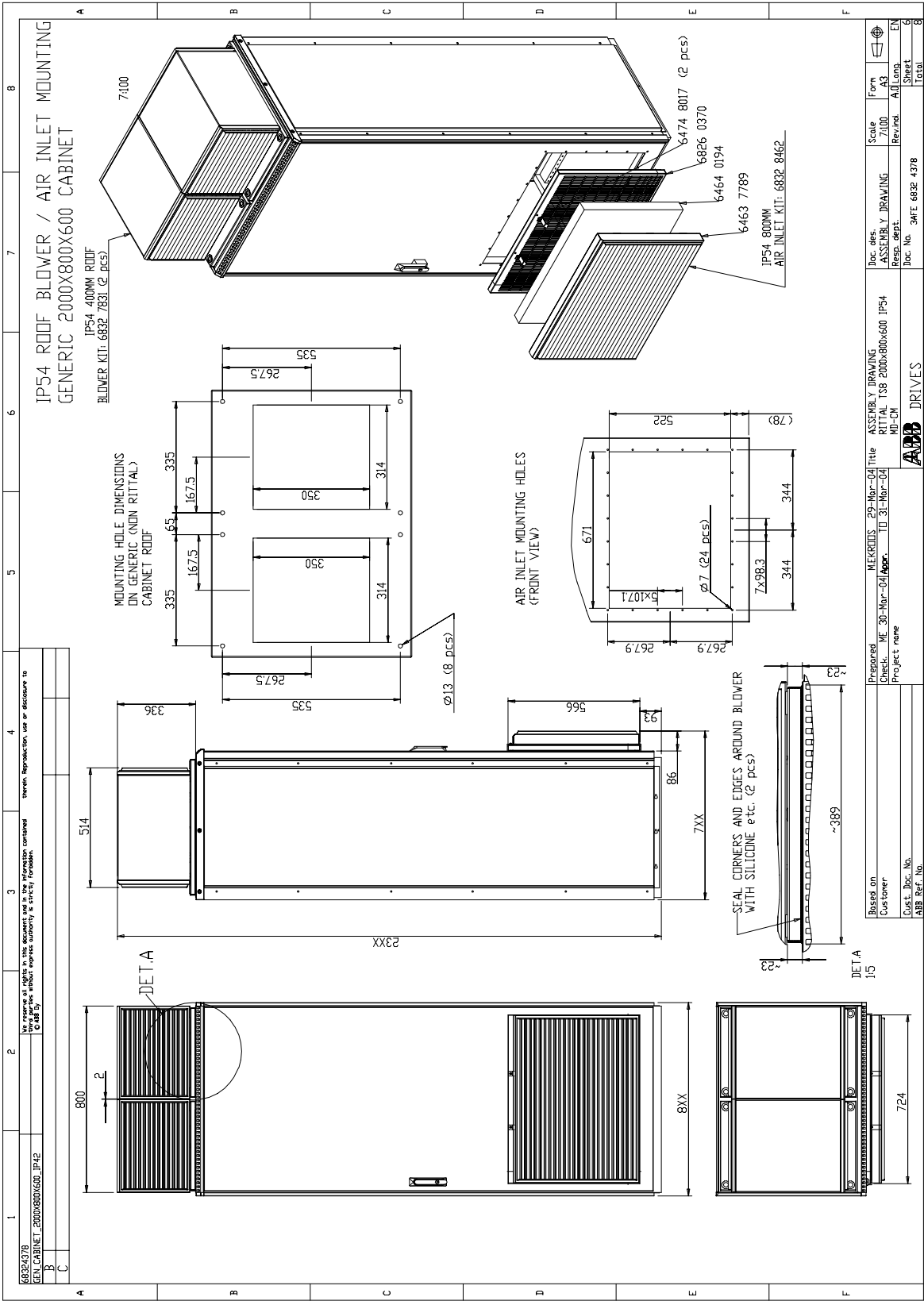
The following drawings show how the ventilation kits (see the chapter *ACS800-104 ordering information*) are installed in the cubicle.

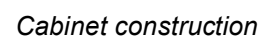


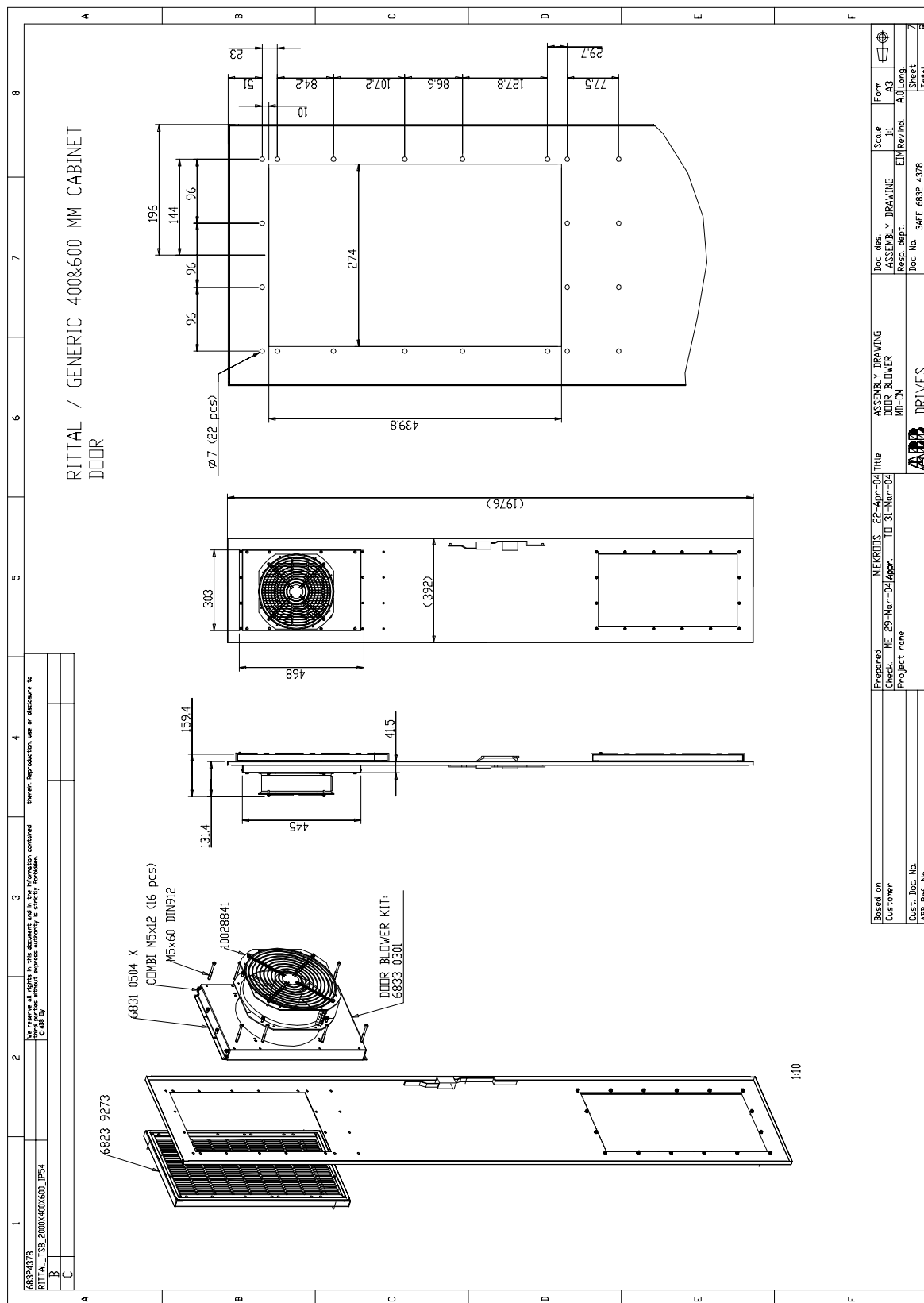
IP54, 600 mm wide Rittal TS 8 cubicle



IP54, 800 mm wide generic cubicle







Electrical installation

What this chapter contains

This chapter describes the electrical installation procedure of ACS800-104 inverter modules.

The wiring diagrams in this chapter are simplified presentations. See the chapter *Circuit diagrams* for details.

Note: The installation must always be designed and made according to applicable local laws and regulations. ABB does not assume any liability whatsoever for any installation which breaches the local laws and/or other regulations. Furthermore, if the recommendations given by ABB are not followed, the drive may experience problems that the warranty does not cover.

General



WARNING! Make sure that the drive system is disconnected from the mains (input power) during installation. If the drive system is already connected to the mains, wait for 5 min after disconnecting mains power. Measure the voltage between the L+ and L– terminals with a multimeter (impedance at least 1 Mohm) to ensure that the drive system is discharged before beginning work.



WARNING! Circuit boards contain components sensitive to electrostatic discharge (ESD). Wear an earthing wrist band when handling the boards. Do not touch the boards unnecessarily.

Notes on Optical Components

Handle fibre optic cables with care. When unplugging optic cables, always grab the connector, not the cable itself. Do not touch the ends of the fibres with bare hands as the fibre is extremely sensitive to dirt. The specifications of the optic cable are as follows:

- Storage temperature: -55 ... +85 °C
- Installation temperature: -20 ... +70 °C
- Maximum short-term tensile force: 50 N
- Minimum short-term bend radius: 25 mm
- Minimum long-term bend radius: 35 mm
- Maximum long-term tensile load: 1 N
- Flexing: Max. 1000 cycles

ABB drive products in general utilise 5 and 10 MBd (megabaud) optical components from Agilent Technologies' (Hewlett-Packard) Versatile Link range. Please note that the optical component type is not directly related to the actual communication speed.

Note: The optical components (transmitter and receiver) on a fibre optic link must be of the same type.

Plastic optical fibre (POF) cables can be used with both 5 MBd and 10 MBd optical components. 10 MBd components also enable the use of Hard Clad Silica (HCS[®]) cables, which allow longer connection distances thanks to their lower attenuation. HCS[®] cables cannot be used with 5 MBd optical components.

The maximum lengths of fibre optic links for POF and HCS[®] cables are 20 and 50 metres respectively.

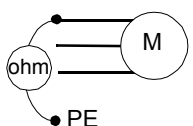
HCS[®] is a trademark of SpecTran Corporation.

Checking the insulation of the assembly

Every ACS800-104 inverter module has been tested for insulation between the main circuit and the chassis (2500 V rms 50 Hz for 1 second) at the factory. Therefore, do not make any voltage tolerance or insulation resistance tests (e.g. hi-pot or megger) on the inverter units or modules. Check the insulation of the assembly as follows.



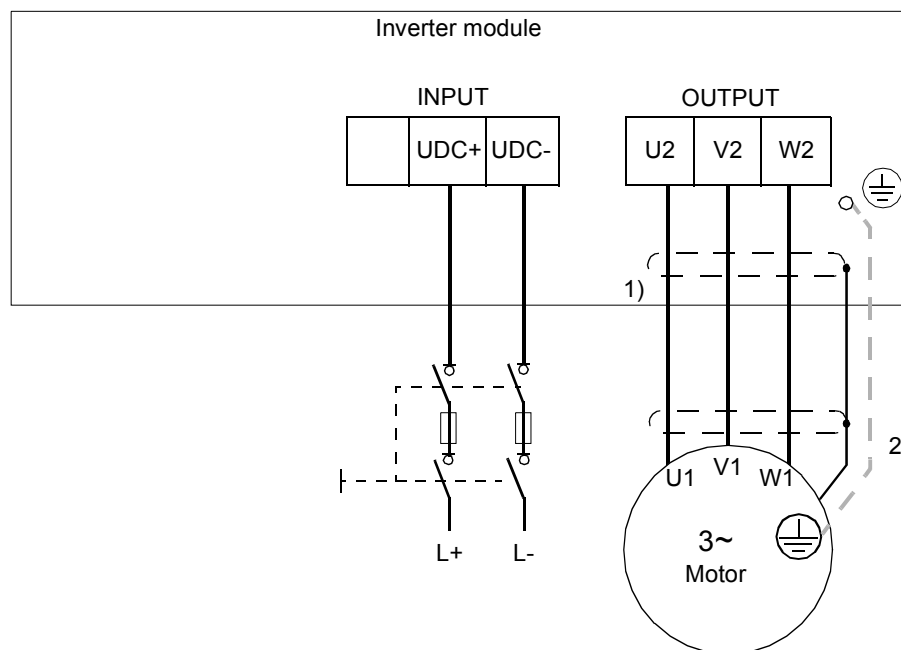
WARNING! Check the insulation before connecting the drive to the main supply. Make sure that the drive is disconnected from the mains (input power).



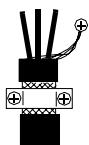
1. Check that the motor cable is disconnected from the drive output terminals U2, V2 and W2.
2. Measure the insulation resistances of the motor cable and the motor between each phase and the Protective Earth by using a measuring voltage of 1 kV DC. The insulation resistance must be higher than 1 Mohm.

Power connections – Frame R2i to R5i

Diagram



1) 360 degrees grounding



2) Use a separate grounding cable if the conductivity of the cable shield is less than 50% of the conductivity of the phase conductor in a cable with no symmetrically constructed grounding conductor (see the document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Note:

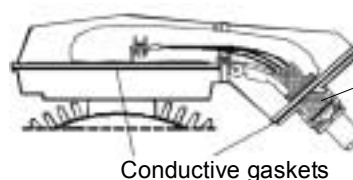
If there is a symmetrically constructed grounding conductor in the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the drive and motor ends.

Do not use an asymmetrically constructed motor cable. Connecting its fourth conductor at the motor end increases bearing currents and causes extra wear.

Grounding of the motor cable shield at the motor end

For minimum radio frequency interference:

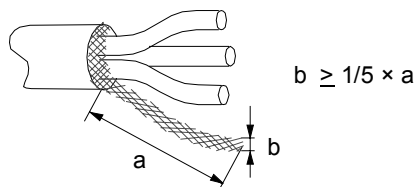
- ground the cable shield 360 degrees at the lead-through of the motor terminal box



360 degrees grounding

Conductive gaskets

- or ground the cable by twisting the shield as follows: flattened width $\geq 1/5 \times \text{length}$.



$$b \geq 1/5 \times a$$

Conductor stripping lengths

Strip the conductor ends as follows to fit them inside the power cable connection terminals.

Frame size	Stripping length	
	mm	in.
R2i, R3i	10	0.4
R4i, R5i	16	0.6

Connection box kit

The inverter module is supplied with a connection box kit containing the following items:

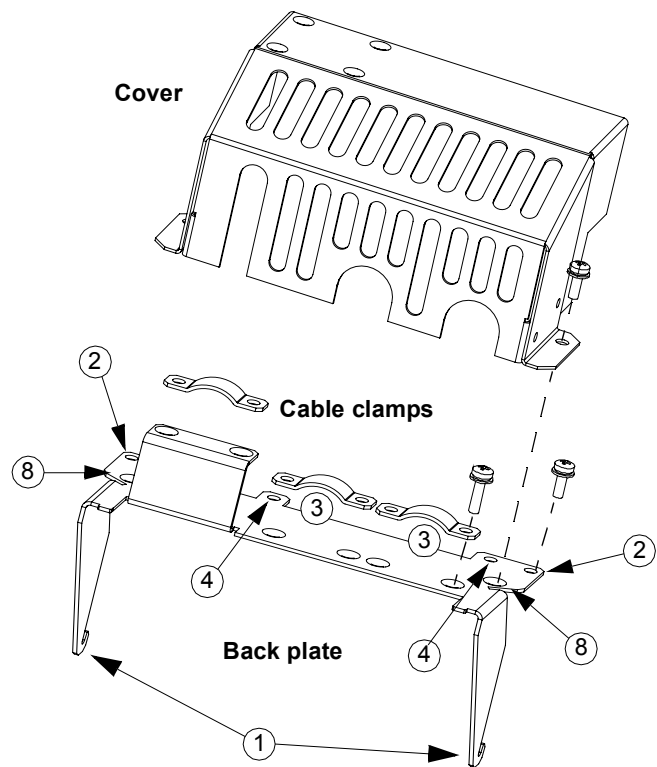
- back plate
- cover
- 3 clamps
- lug terminals (frame sizes R2i and R3i only)
- screws.

The kit also contains a shroud for covering the relay outputs of the RMIO board.

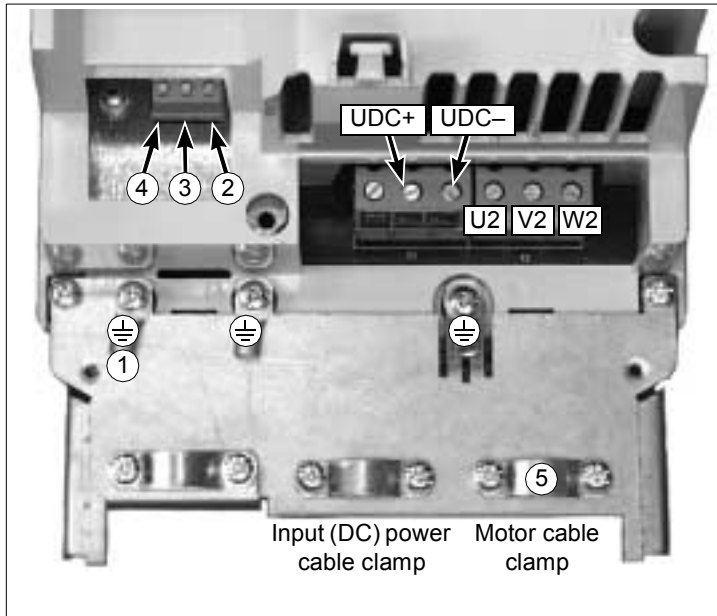
Cable connection procedure

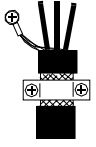
Refer to the diagram below.

1. Insert the hooks of the connection box back plate to the two corresponding slots in the bottom plate of the inverter module.
2. Fasten the back plate to the module frame with two screws.
3. Strip off the plastic sheaths of the input (DC) cable (if of shielded type) and motor cables under the cable clamps. Fasten the clamps onto the stripped part of the cable.
4. (Frame sizes R2i and R3i) Crimp a lug terminal (supplied in the connection box kit) onto the twisted shields of the cables.
(All frame sizes) Connect the shields to the grounding terminals.
5. Connect the conductors of the input (DC) cable to the UDC+ and UDC– terminals and the phase conductors of the motor cable to the U2, V2 and W2 terminals.
6. Secure the cables outside the unit mechanically.
7. Connect the control cables as described in section *Control connections*.
8. Fasten the cover to the back plate with two screws.

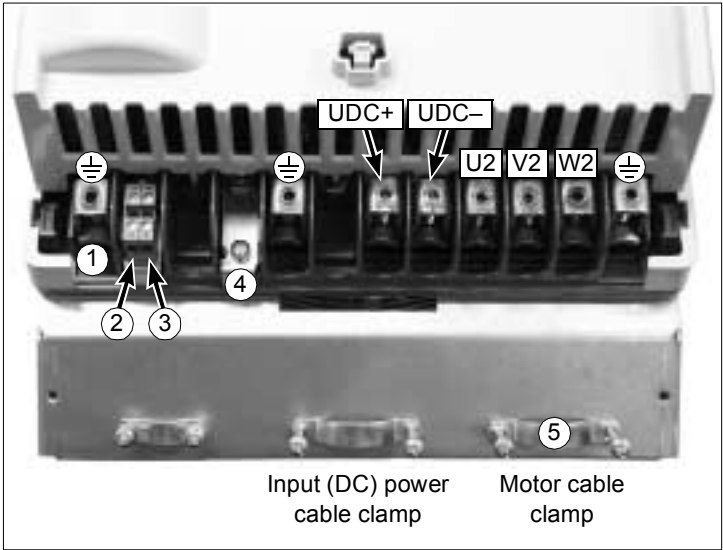


Frame R2i to R4i power connections
Frame R3i pictured.



Item No.	Information
1	Connect to PE busbar of cabinet.
2...4	Prevention of unexpected start (optional). See also the chapter <i>Circuit diagrams</i> .
2	L (95...265 V AC). Voltage must be ON for the inverter to start.
3	N
4	PE
5	Strip off the outer sheathing of the cable at the clamp. 

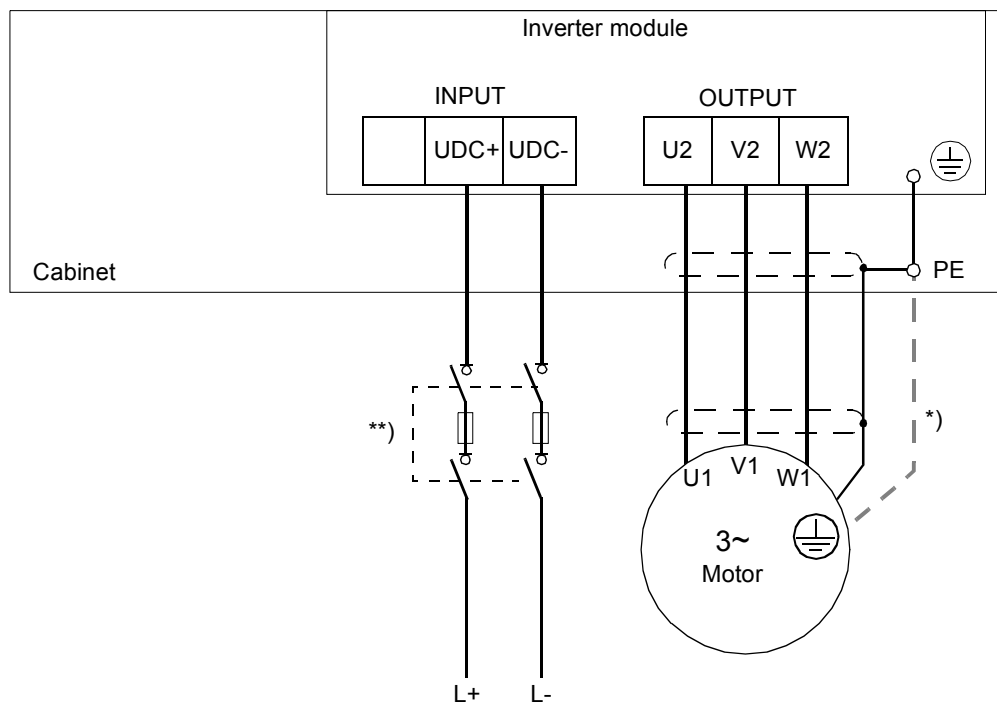
Frame R5i power connections



Item No.	Information
1	Connect to PE busbar of cabinet.
2...4	Prevention of unexpected start (optional). See also the chapter <i>Circuit diagrams</i> .
2	L (95...265 V AC). Voltage must be ON for the inverter to start.
3	N
4	PE
5	Strip off the outer sheathing of the cable at the clamp.

Power connections – Frame R7i

Diagram



*Use a separate grounding cable if the conductivity of the cable shield is less than 50% of the conductivity of the phase conductor in a cable with no symmetrically constructed grounding conductor (see the document *ACS 800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Note:

If there is a symmetrically constructed grounding conductor in the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the drive and motor ends.

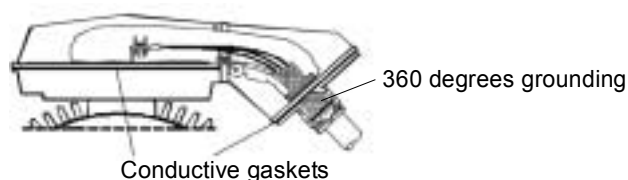
Do not use an asymmetrically constructed motor cable. Connecting its fourth conductor at the motor end increases bearing currents and causes extra wear.

**The inverter module can be connected to the DC bus through a switch fuse or through fuses only. Using a switch fuse requires internal charging control (option code +F272).

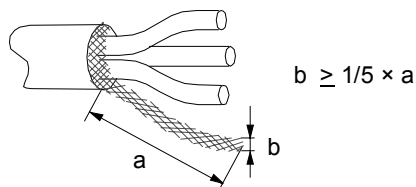
Grounding of the motor cable shield at the motor end

For minimum radio frequency interference:

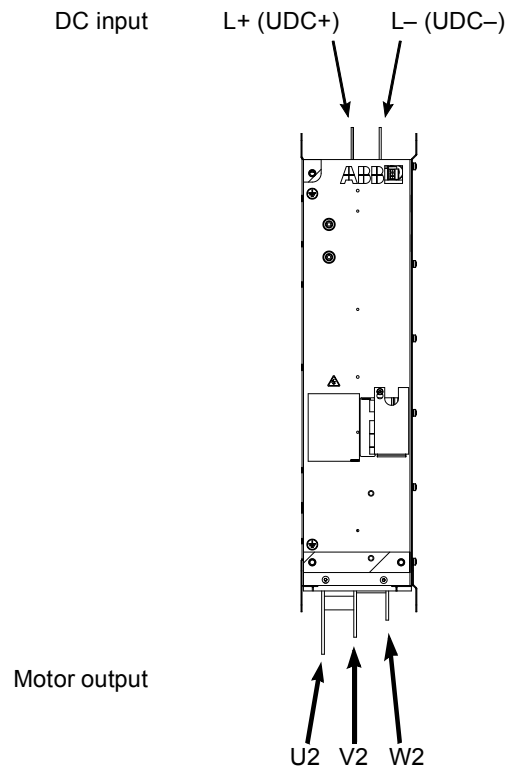
- ground the cable shield 360 degrees at the lead-through of the motor terminal box



- or ground the cable by twisting the shield as follows: flattened width $\geq 1/5 \times \text{length}$.



DC and motor connections

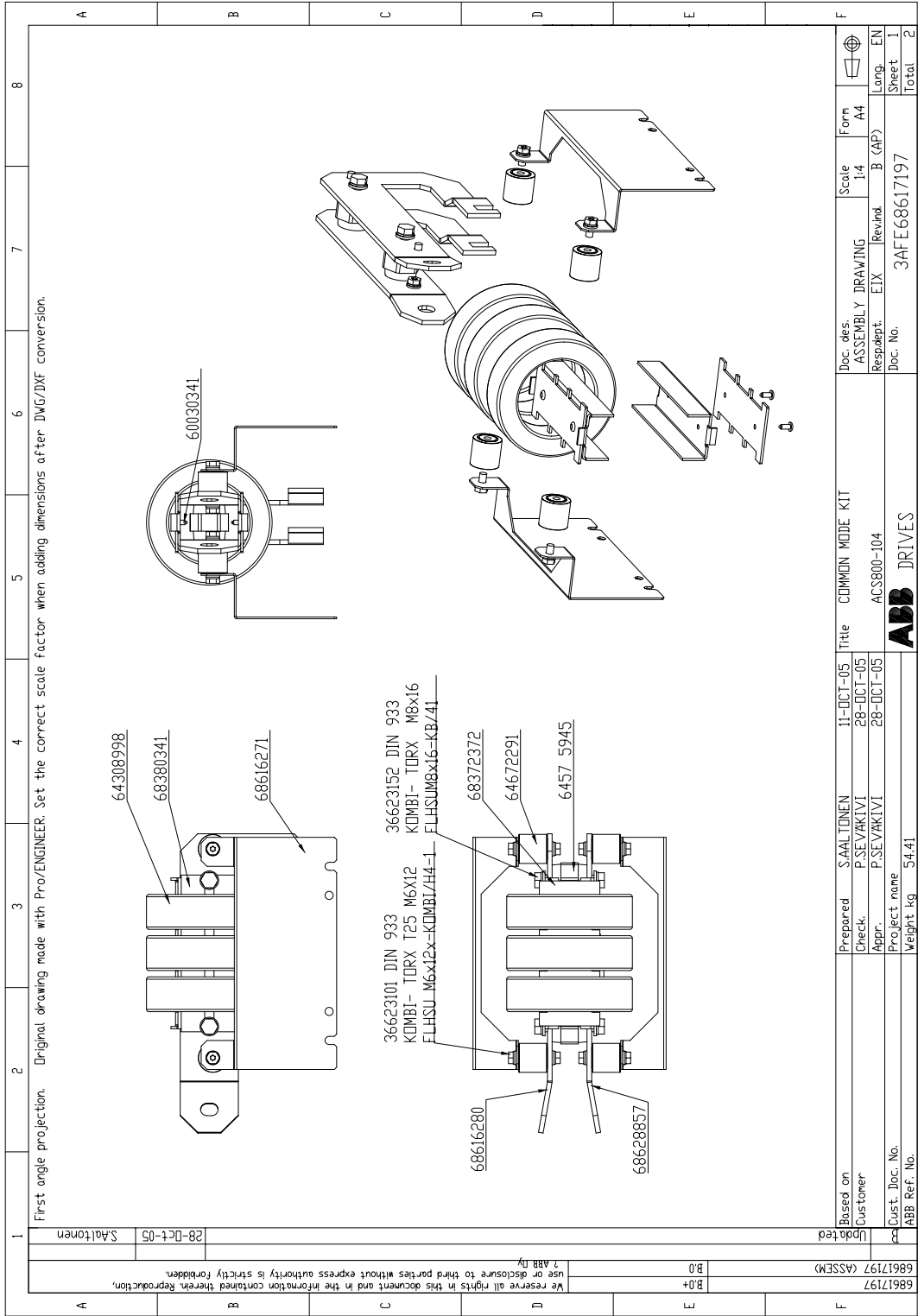


Charging circuit

Installing a switch fuse between the inverter module(s) and the DC link necessitates a charging circuit. Frame R7i modules are optionally available with an internal charging circuit (option +F272).

Common mode filtering

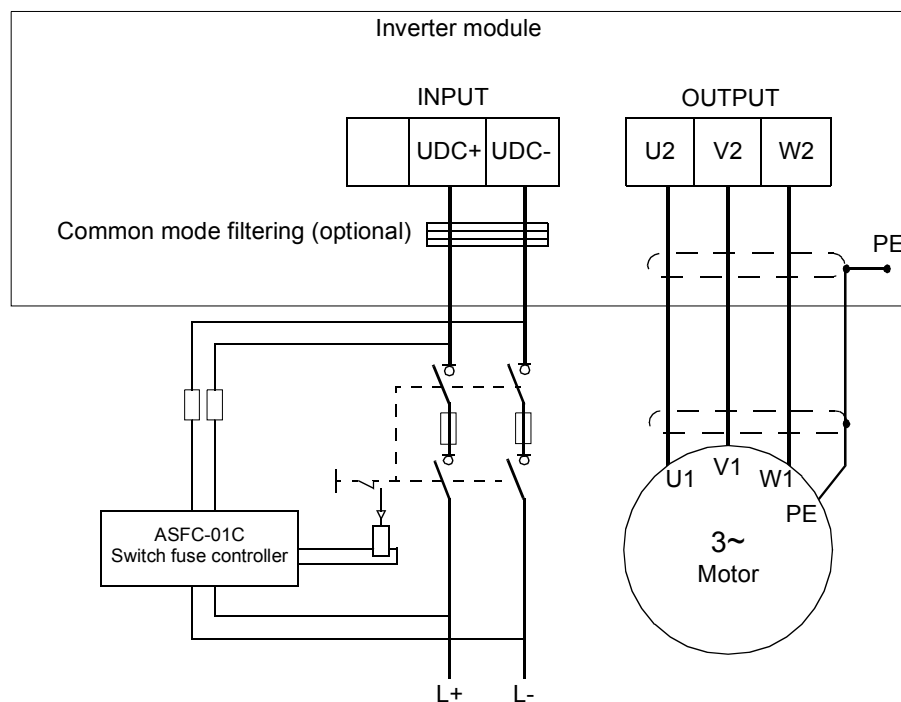
A common mode filter kit is available, consisting of three toroidal cores with the necessary mounting parts (see the chapter *ACS800-104 ordering information*). The drawings below show how the common mode filters are installed.



Power connections – Frame R8i and multiples

See also the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742 [English]).

Wiring diagram



DC connection

The DC connection busbars are located at the top of the module. See the dimensional diagrams for the exact location. Busbar sets for the DC connection with holders for common mode filter toroids are available, and pictured in the chapter *Cabinet construction*.



WARNING! Make sure the M12 screws used for connecting the DC link to the inverter module do not extend into the module farther than 20 mm.

Charging circuit

Installing a switch fuse between the inverter module(s) and the DC link necessitates a charging circuit. The charging circuit contains two resistors per inverter module and a switch fuse controller (type ASFC-01C). The resistors and the controller are included in the switch fuse kits.

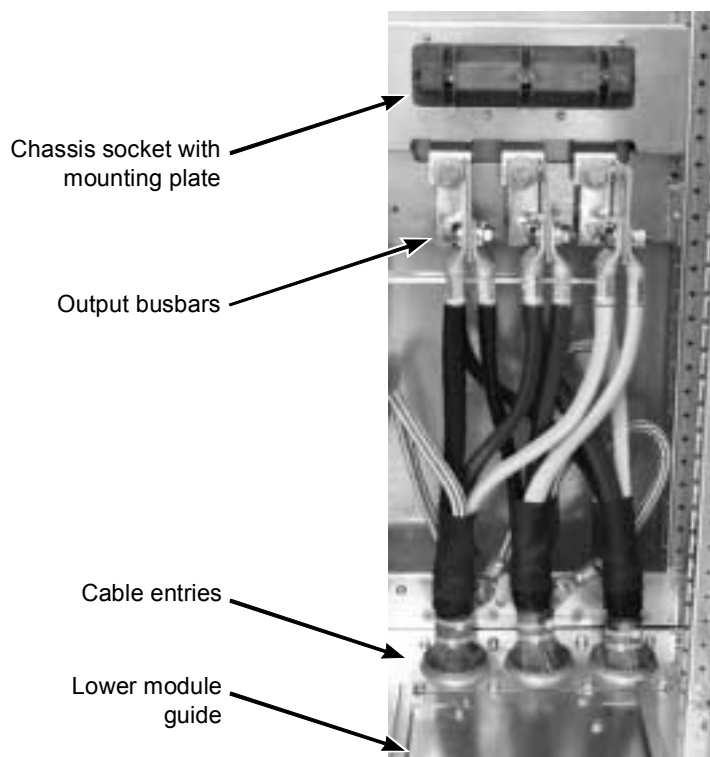
The minimum wire sizes to be used in the charging circuit are as follows:

- DC bus to fuses: 2.5 mm² (AWG 14), **double-insulated**
- ASFC to ground: 2.5 mm² (AWG 14)
- From fuses/ASFC to charging resistors: 1.5 mm² (AWG 14)
- Switch fuse auxiliary contact/solenoid wiring; auxiliary voltage supply to ASFC: 0.75 mm² (AWG 18).

The ASFC is also to be connected to the AINT board of the inverter module(s) by a fibre optic link. See section *Control connections of the module* on page 79.

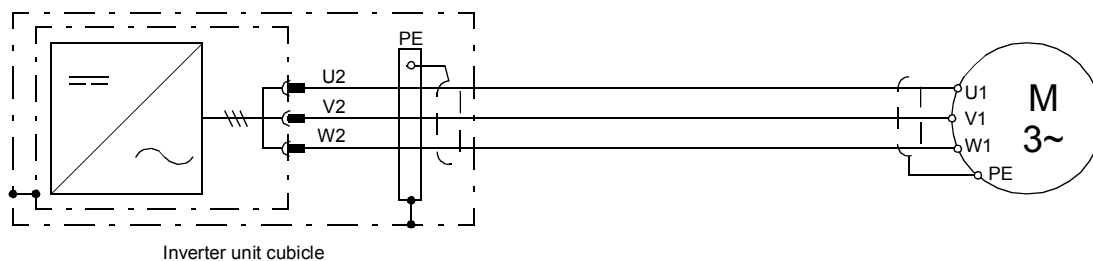
Motor connection

The motor connection of frame R8i inverter modules is located at the back of the module so that a quick connector can be used, enabling easy extraction of the module from the cabinet for maintenance. The chassis socket – available separately with different mounting parts – is attached to the rear part of the cubicle (see the examples in the chapter *Cabinet construction*). The picture below shows a cabling example.

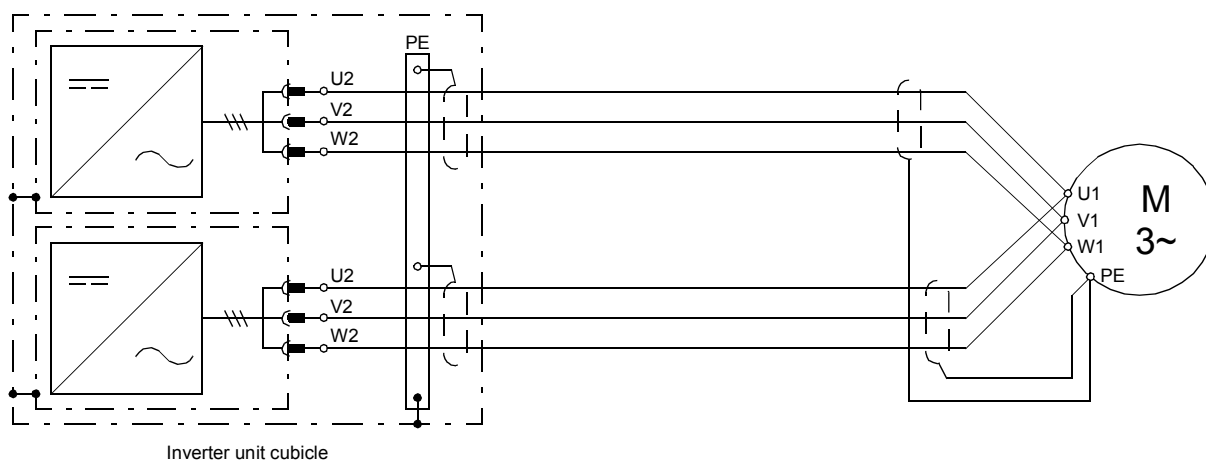


Direct motor cabling

The diagram below shows the connection of the motor when the inverter unit consists of one inverter module only.

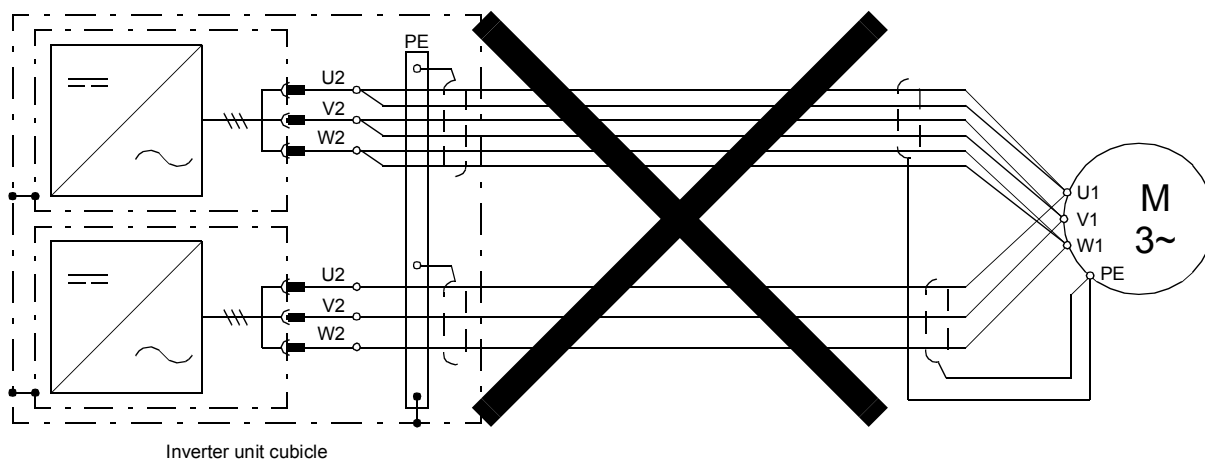
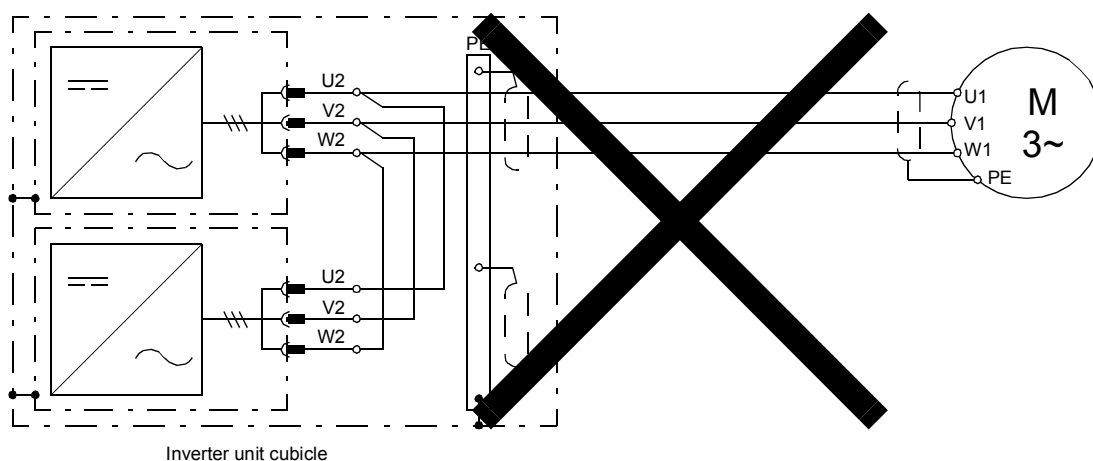


If a common motor terminal cubicle is not used, all the inverter modules in a parallel configuration (2×R8i, 3×R8i, etc.) are to be cabled separately to the motor as shown in the diagram below.





WARNING! The cabling from all inverter modules to the motor must be physically identical considering cable type, cross-sectional area, and length. For example, “jumping” the cables from one inverter module to another (and then to the motor) is not allowed.



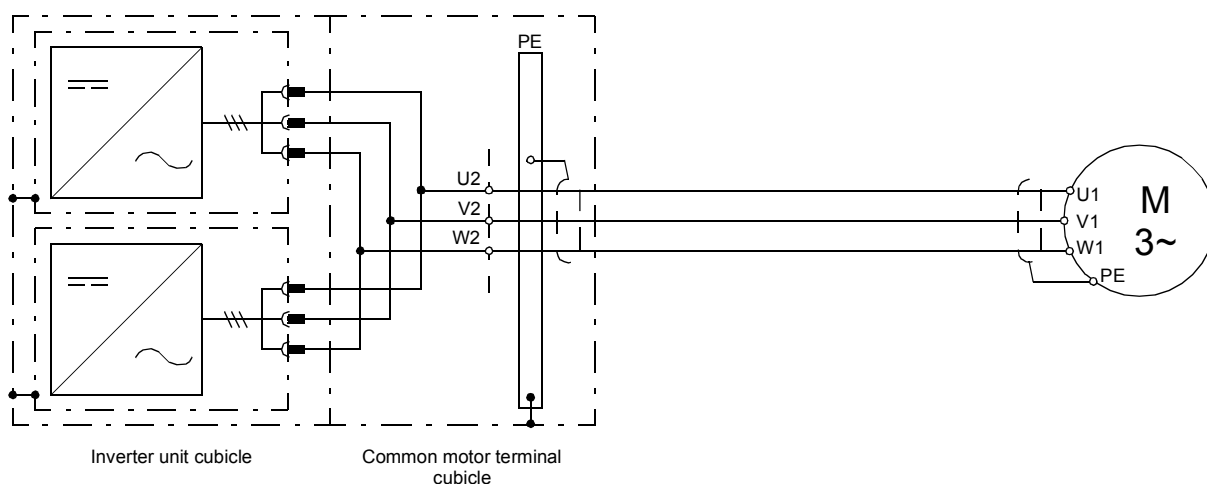
Common motor terminal cubicle

Instead of direct cabling from each inverter module to the motor, it is also possible to build a common motor terminal cubicle.



WARNING! If a common motor terminal cubicle is constructed, the inverter modules must be equipped with the **+E205** option (internal du/dt filters).

Note that the distance from both modules to the common output should be of roughly equal length.

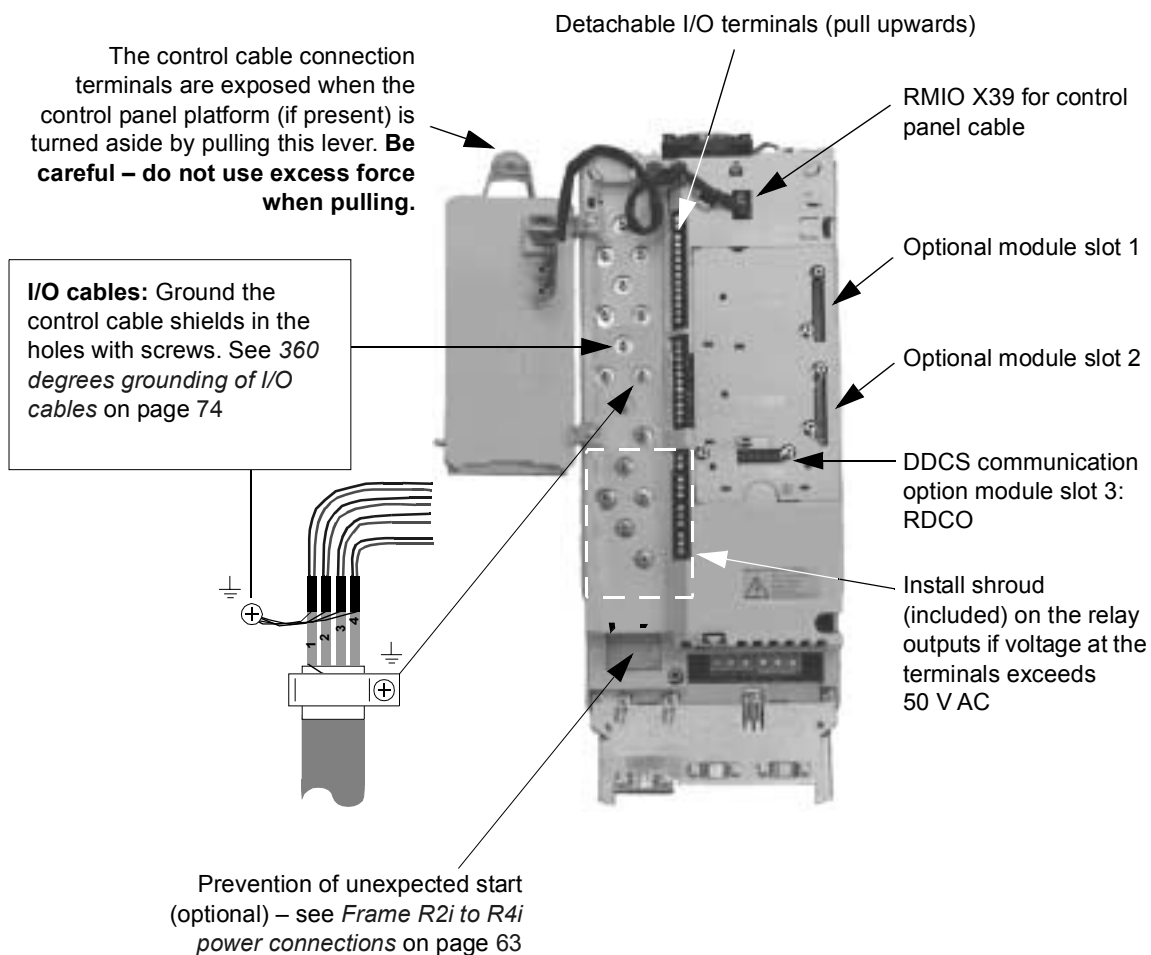


Control connections

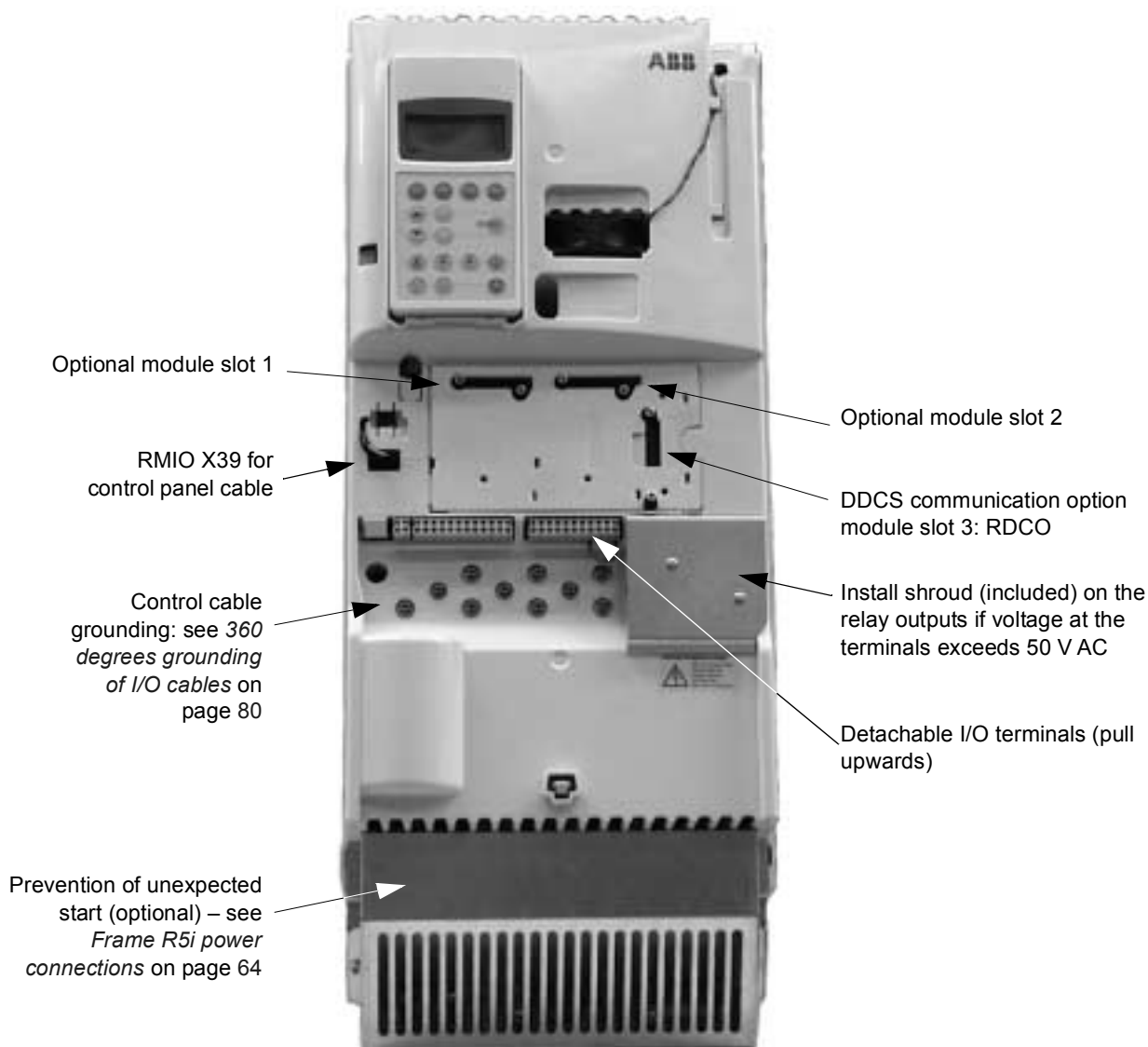
Frame R2i to R5i

These inverter modules have a built-in RMIO (Motor control and I/O) board. For descriptions of the terminals, see the chapter *Motor control and I/O board (RMIO)*.

Frame R2i to R4i (R3i pictured)



Frame R5i



External +24 V power supply for the RMIO board

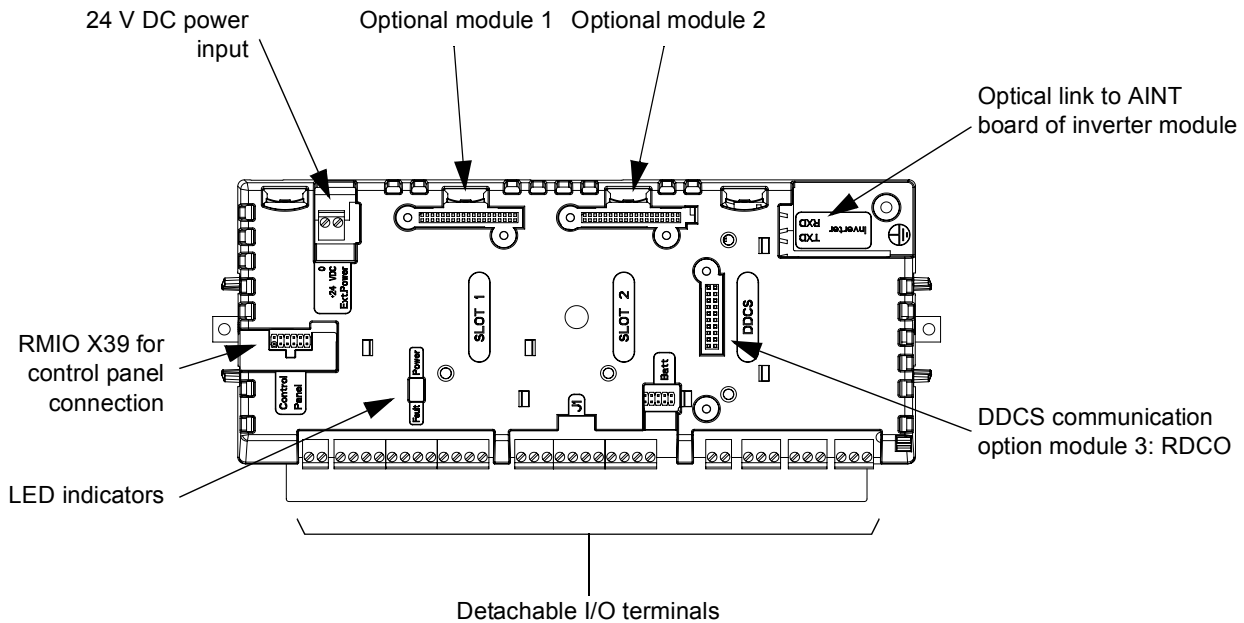
The RMIO board of the inverter module can be powered from an external 24 V DC supply. This is practical if the board needs to be kept live even if the main power to the drive is off. The 24 V supply can be fed by a UPS if necessary.

Refer to chapter *External +24 V power supply for the RMIO board (Frames R2i to R5i)*, starting on page 95.

Frame R7i

Drive control unit

Inverter units consisting of a frame R7i inverter module employ a separate control unit, RDCU-02C, containing the RMIO board. For the terminals of the RMIO board, see the chapter *Motor control and I/O board (RMIO)*. For further information on the RDCU-02C, see the document *RDCU-02(C) Drive Control Unit Hardware Manual* (3AFE 64636324 [English]).



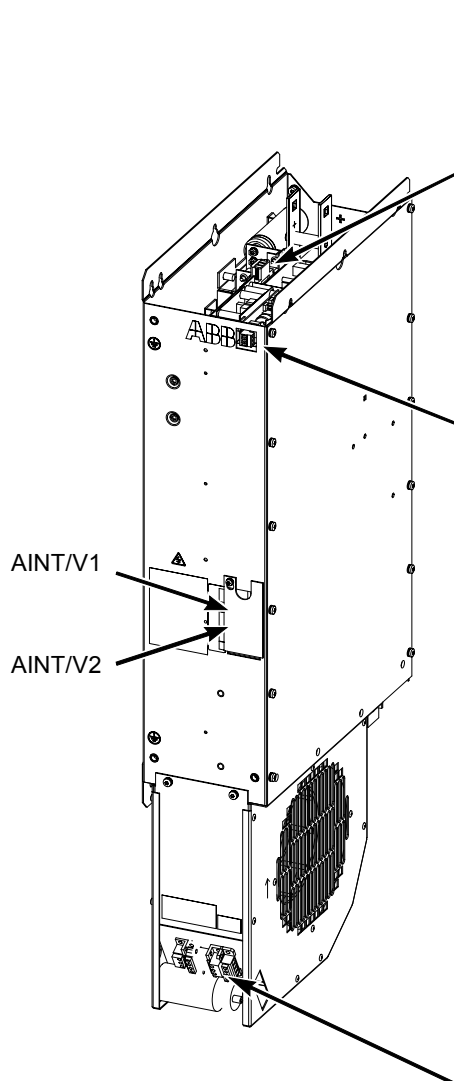
A fibre optic link is used to connect the RDCU to the AINT board in the inverter module.

The connections between the control unit and the inverter module are shown in the chapter *Circuit diagrams*.

Control connections of the module

The fibre optic connectors on the AINT board of the inverter module are accessible through an opening on the front. The connectors of the AGPS board (units equipped with the Prevention of unexpected start option) are also accessible through the front of the module.

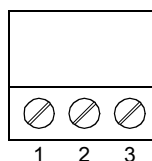
The auxiliary voltage for the cooling fan is to be connected to terminal block X42. The voltage can be wired through terminal block X50 for temperature-based on/off control.



X50

Terminal no.	Information
1	Fan control - AC in.
2	Fan control - AC out.
3	Not connected.

AGPS/X1



Terminal no.	Information
1...3	Prevention of unexpected start (optional). See also the chapter <i>Circuit diagrams</i> .
1	PE
2	N
3	L 95...132 V AC (with jumper set to "115V"); 185...265 V AC (with jumper set to "230V"). Voltage must be ON for the inverter to start.

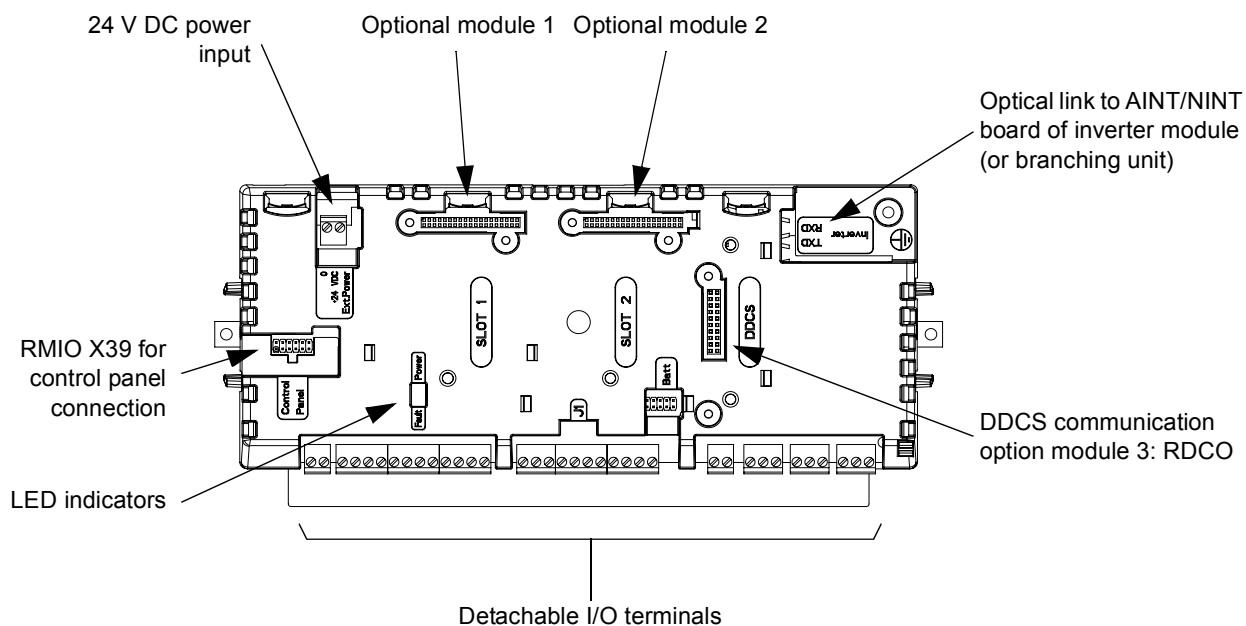
X42

Terminal no.	Information
1...4	Cooling fan power input. 230 V AC (115 V AC with option +G304)
1	L
2	N
3	Not connected.
4	PE

Frame R8i and multiples

Drive control unit

Inverter units consisting of frame R8i inverter modules employ a separate control unit, RDCU-02C, containing the RMIO board. For the terminals of the RMIO board, see the chapter *Motor control and I/O board (RMIO)*. For further information on the RDCU-02C, see the document *RDCU-02(C) Drive Control Unit Hardware Manual* (3AFE 64636324 [English]).



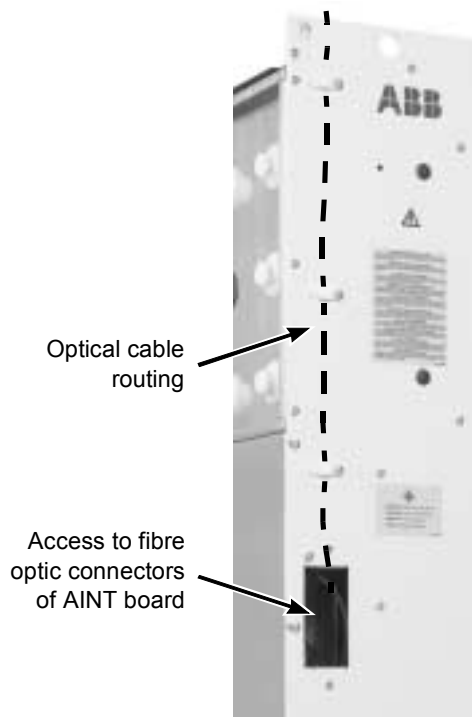
A fibre optic link is used to connect the RDCU to the AINT board in the inverter module. In case of parallel-connected inverter modules, a PPCS branching unit (type NPBU or APBU) distributes the optical control link to all the modules.

The switch fuse controller board (ASFC), used in conjunction with R8i modules, also connects to the AINT board of each inverter module through a fibre optic link.

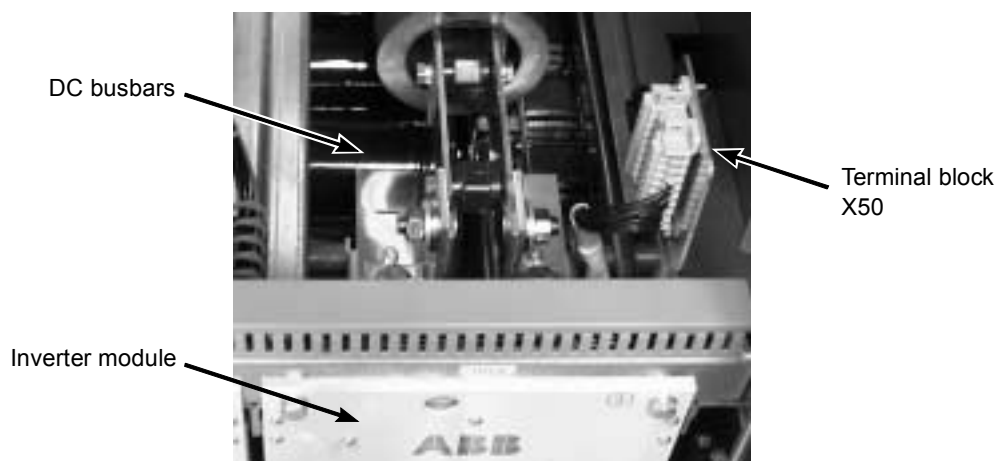
The connections between the control unit, branching unit (if present), switch fuse controller and the inverter module are shown in the chapter *Circuit diagrams*.

Control connections of the module

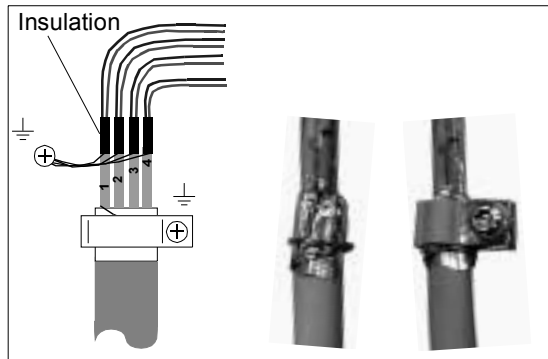
The fibre optic connectors (for connections to both the RDCU and the ASFC boards) on the AINT board of the inverter module are accessible through an opening on the front.



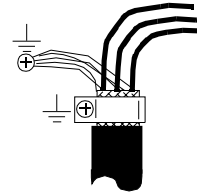
If the inverter module is equipped with the Prevention of unexpected start option (**+Q950**), or not equipped with a speed-controlled fan (option **+C126**), the necessary connections are made via a detachable terminal block (X50). The counterpart – included in the delivery – can be installed near the top of the module. In the picture below, the terminal block is installed on the mounting plate on the upper guide of the module.



360 degrees grounding of I/O cables



Double shielded cable



Single shielded cable

When the outer surface of the shield is covered with non-conductive material

- Strip the cable carefully (do not cut the grounding wire and the shield)
- Turn the shield inside out to expose the conductive surface.
- Wrap the grounding wire around the conductive surface.
- Slide a conductive clamp onto the conductive part.
- Fasten the clamp to the grounding plate with a screw as close as possible to the terminals where the wires are about to be connected.

Connecting the shield wires

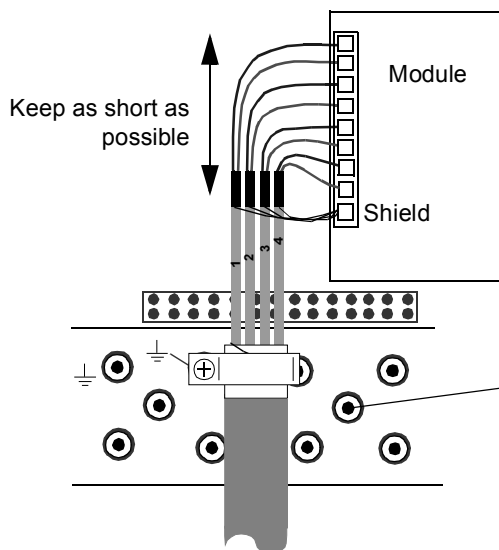
Single shielded cables: Twist the grounding wires of the outer shield and connect them through the shortest possible route to the nearest grounding hole with a cable lug and a screw. Double shielded cables: Connect each pair cable shield (twisted grounding wires) with other pair cable shields of the same cable to the nearest grounding hole with a cable lug and a screw.

Do not connect shields of different cables to the same cable lug and grounding screw.

Leave the other end of the shield unconnected or ground it indirectly via a few nanofarads high-frequency capacitor (e.g. 3.3 nF / 630 V). The shield can also be grounded directly at both ends if they are *in the same ground line* with no significant voltage drop between the end points.

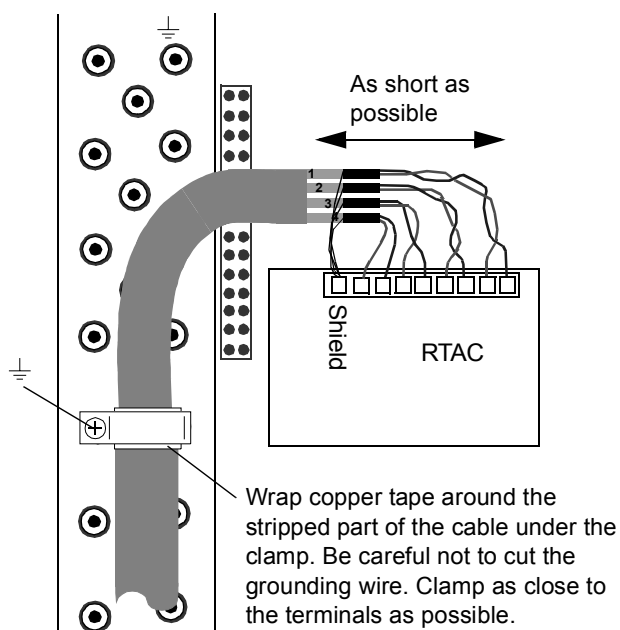
Keep the signal wire pairs twisted as close to the terminals as possible. Twisting the wire with its return wire reduces disturbances caused by inductive coupling.

Cabling of I/O and fieldbus modules



Note: The RDIO module does not include a terminal for cable shield grounding. Ground the pair cable shields here.

Pulse encoder module cabling



Note 1: If the encoder is of unisolated type, ground the encoder cable at the drive end only. If the encoder is galvanically isolated from the motor shaft and the stator frame, ground the encoder cable shield at the drive and the encoder end.

Note 2: Twist the pair cable wires.

Installation of optional modules and PC

Optional modules (such as fieldbus adapters, I/O extension modules and the pulse encoder interface) are inserted in the optional module slot of the RMIO board and fixed with two screws. See the appropriate optional module manual for cable connections.

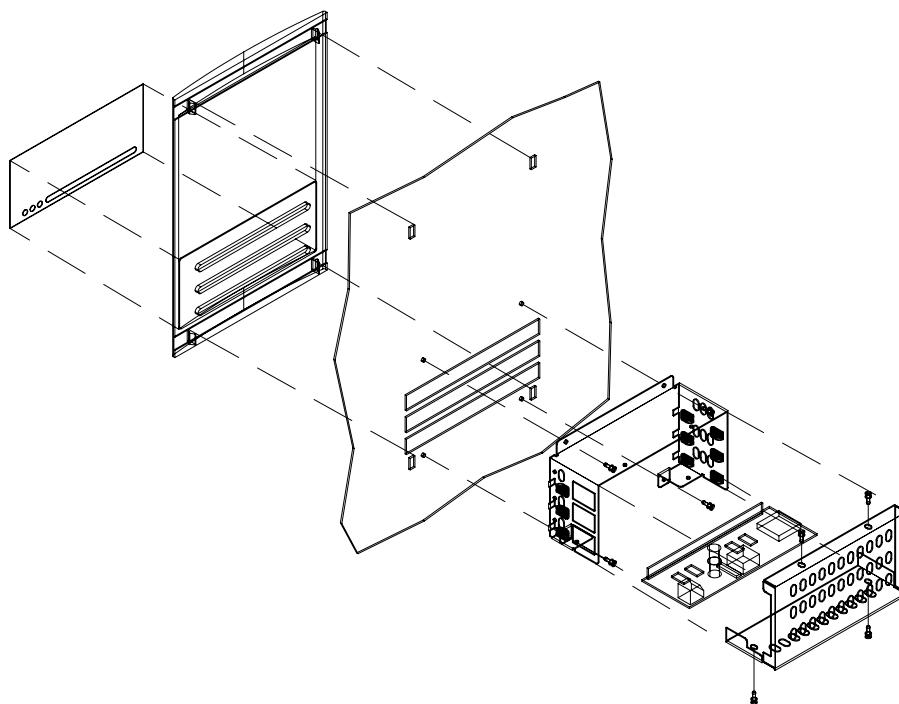
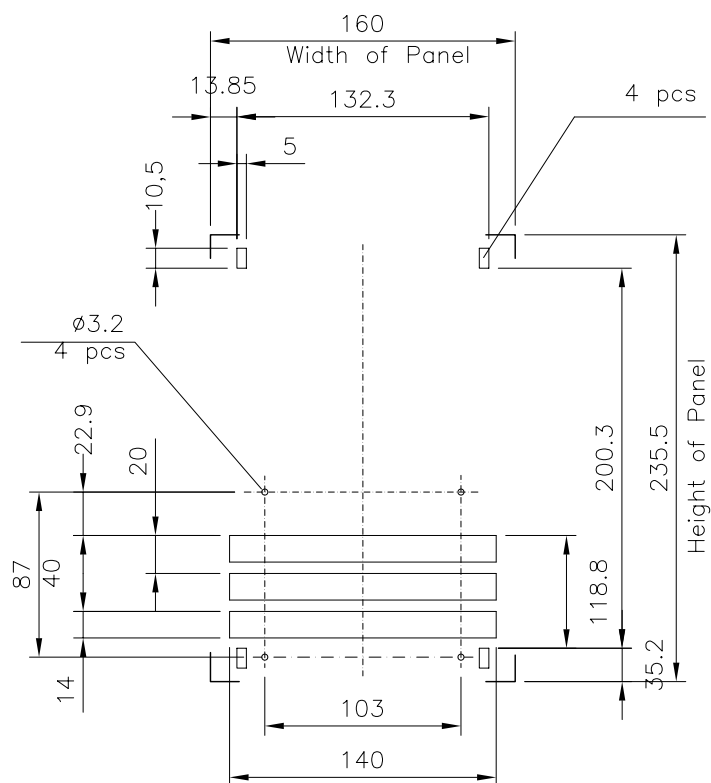
Fibre optic links

DDCS fibre optic links are provided by the RDCO module (optional) for PC tools, master/follower link, NDIO, NTAC, NAIIO and fieldbus adapter modules of type Nxxx. See *RDCO User's Manual* for the connections. Observe colour coding when installing fibre optic cables: blue connectors go to blue terminals, and grey connectors to grey terminals.

When installing multiple devices on the same channel, connect them in a ring.

Installation of NLMD-01 LED Monitoring Display

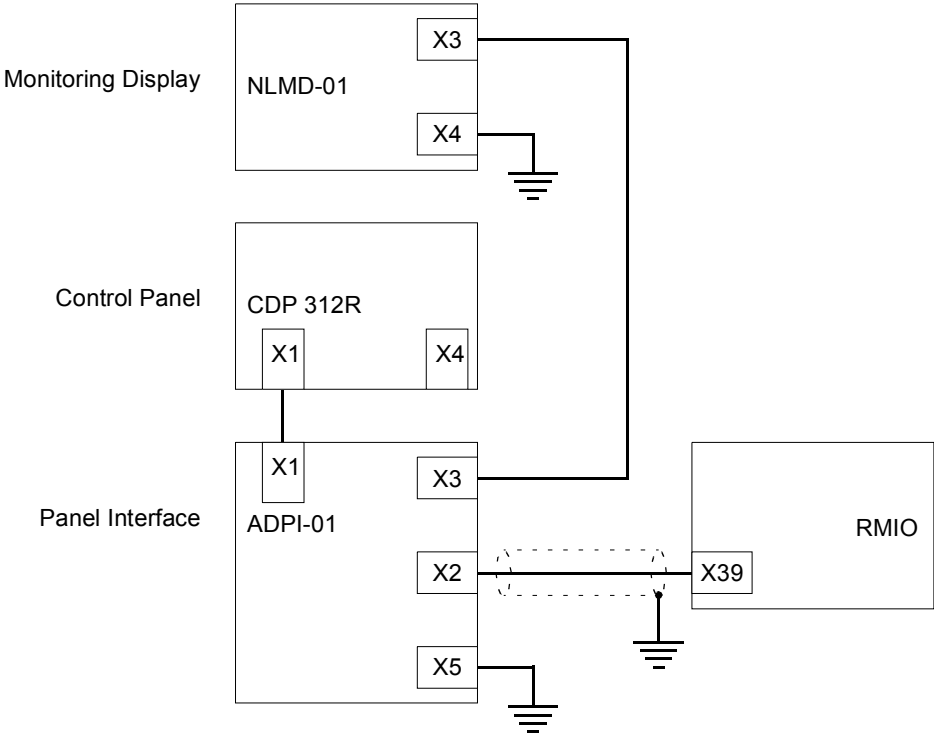
Mechanical installation



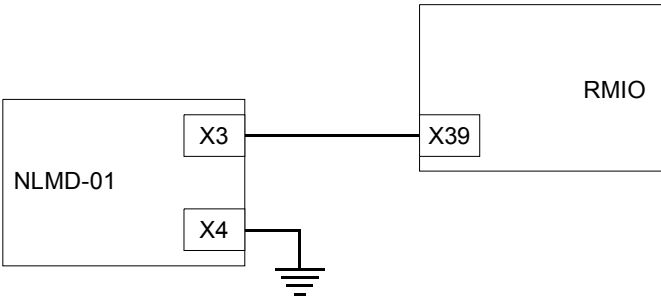
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Wiring

Control panel with monitoring display

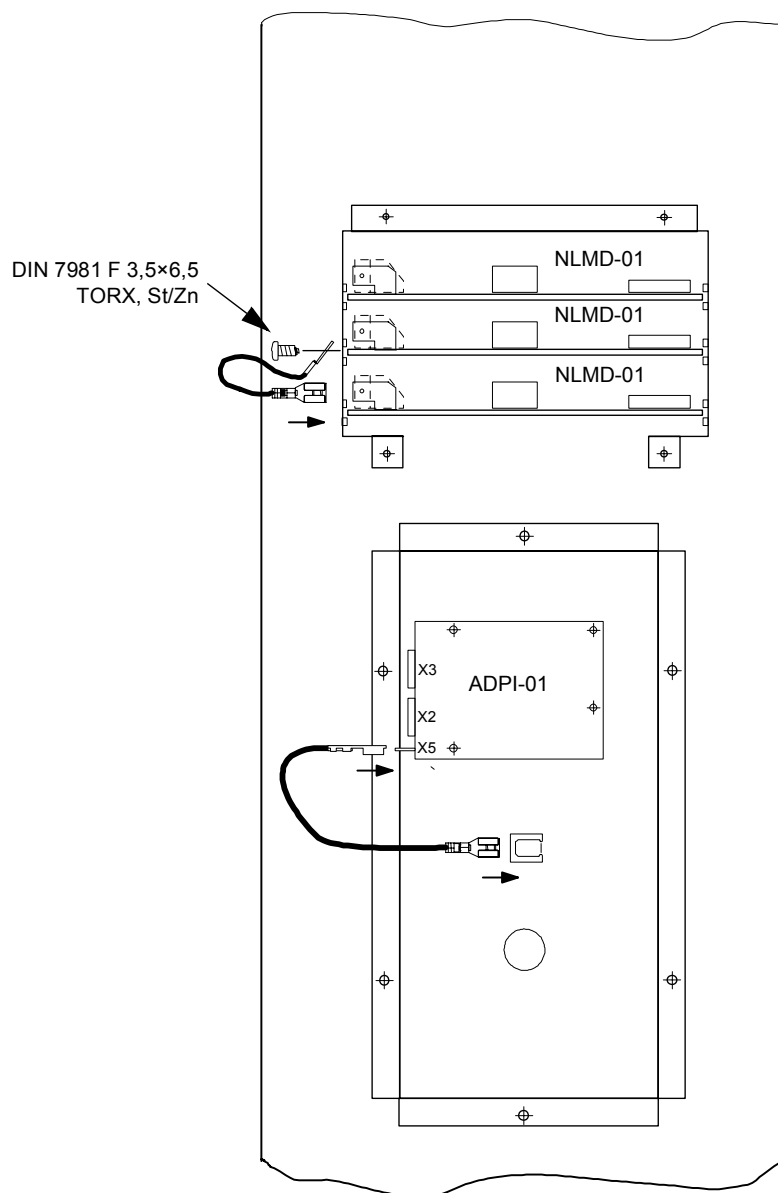


Monitoring display only



Earthing

Each NLMD-01 board is to be individually earthed. The earthing wires are included in the control panel platform and LED display kits.



Motor control and I/O board (RMIO)

What this chapter contains

This chapter shows

- external control connections to the RMIO board for the the ACS 800 Standard Application Program (Factory Macro)
- specifications of the inputs and outputs of the board.

To which products this chapter applies

This chapter applies to ACS800 units which employ the RMIO-01 board (revision J or later) or the RMIO-02 board (revision H or later).

Note on cabinet-installed ACS800 drives

The terminals of the RMIO board are optionally wired to terminal block X2. The connections shown below apply also to terminal block X2 (the markings are identical to the ones on the RMIO board).

Terminals of X2 accept cables from 0.5 to 4.0 mm² (22 to 12 AWG). The tightening torque for screw terminals is 0.4 to 0.8 Nm (0.3 to 0.6 lbf.ft). For disconnecting wires from spring terminals, use a screwdriver with a blade thickness of 0.6 mm (0.024") and width of 3.5 mm (0.138"), e.g. Phoenix Contact SZF 1-0,6X3,5.

Note on terminal labelling

Optional modules (type Rxxx) may have terminal designations that coincide with those on the RMIO board.

External control connections (non-US)

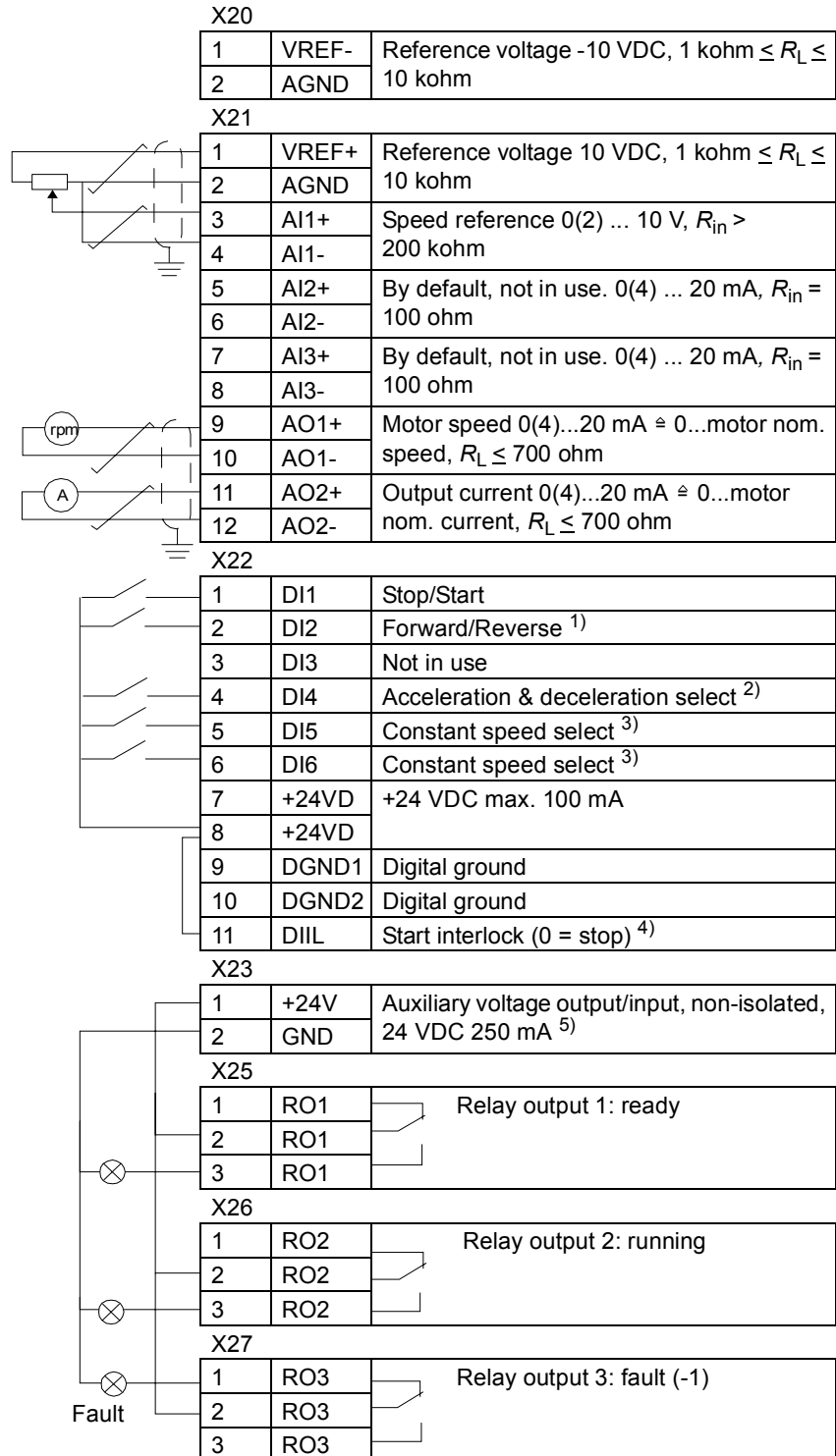
External control cable connections to the RMIO board for the ACS 800 Standard Application Program (Factory Macro) are shown below. For external control connections of other application macros and programs, see the appropriate *Firmware Manual*.

Terminal block size:

cables 0.3 to 3.3 mm² (22 to 12 AWG)

Tightening torque:

0.2 to 0.4 Nm (0.2 to 0.3 lbf ft)



¹⁾ Only effective if par. 10.03 is set to REQUEST by the user.

²⁾ 0 = open, 1 = closed

DI4	Ramp times according to
0	parameters 22.02 and 22.03
1	parameters 22.04 and 22.05

³⁾ See par. group 12 CONSTANT SPEEDS.

DI5	DI6	Operation
0	0	Set speed through AI1
1	0	Constant speed 1
0	1	Constant speed 2
1	1	Constant speed 3

⁴⁾ See parameter 21.09 START INTRL FUNC.

⁵⁾ Total maximum current shared between this output and optional modules installed on the board.

External control connections (US)

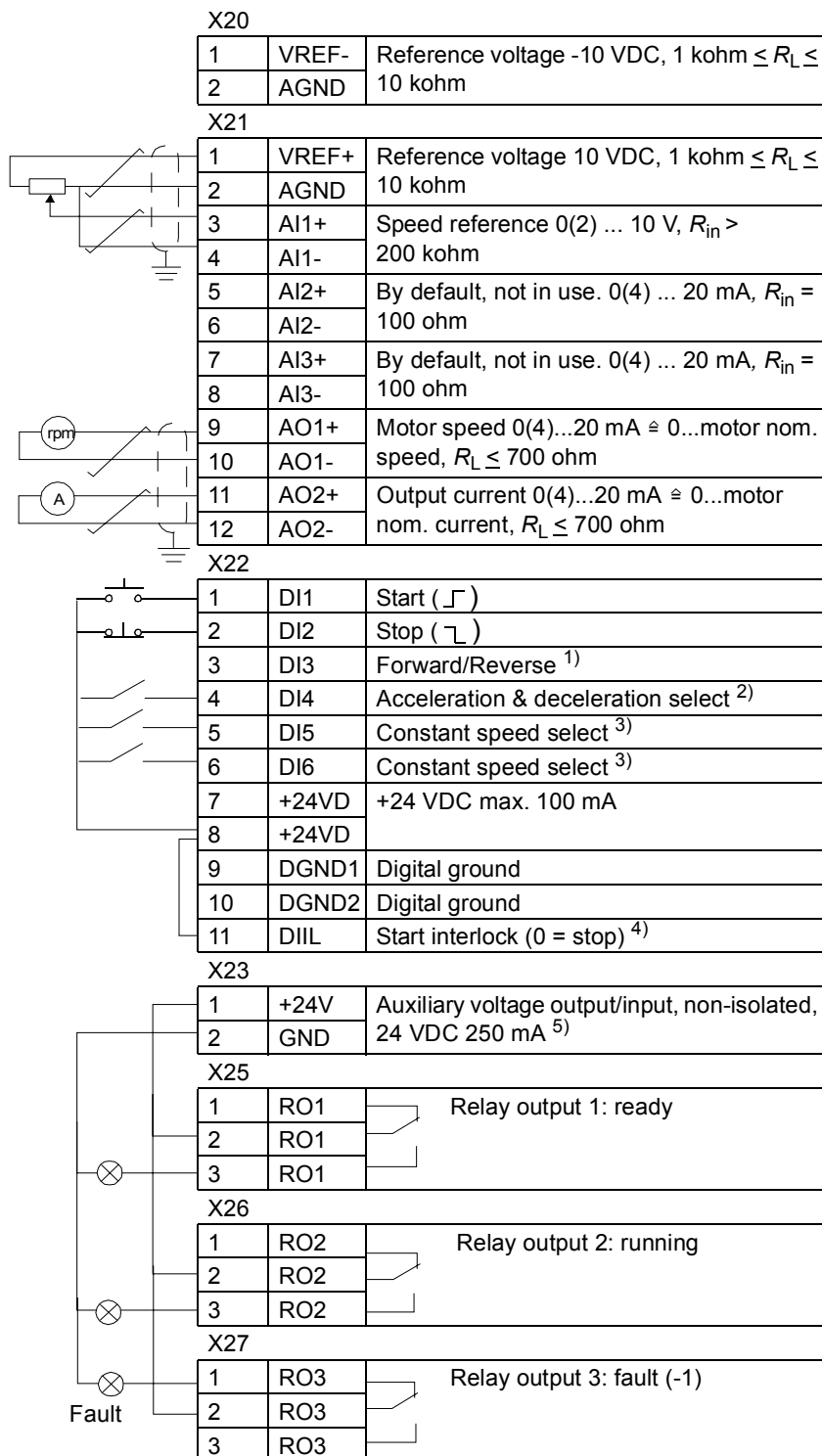
External control cable connections to the RMIO board for the ACS 800 Standard Application Program (Factory Macro US version) are shown below. For external control connections of other application macros and programs, see the appropriate *Firmware Manual*.

Terminal block size:

cables 0.3 to 3.3 mm² (22 to 12 AWG)

Tightening torque:

0.2 to 0.4 Nm (0.2 to 0.3 lbf ft)



¹⁾ Only effective if par. 10.03 is set to REQUEST by the user.

²⁾ 0 = open, 1 = closed

DI4	Ramp times according to
0	parameters 22.02 and 22.03
1	parameters 22.04 and 22.05

³⁾ See par. group 12 CONSTANT SPEEDS.

DI5	DI6	Operation
0	0	Set speed through AI1
1	0	Constant speed 1
0	1	Constant speed 2
1	1	Constant speed 3

⁴⁾ See parameter 21.09 START INTRL FUNC.

⁵⁾ Total maximum current shared between this output and optional modules installed on the board.

RMIO board specifications

Analogue inputs

	With Standard Application Program two programmable differential current inputs (0 mA / 4 mA ... 20 mA, $R_{in} = 100 \text{ ohm}$) and one programmable differential voltage input (-10 V / 0 V / 2 V ... +10 V, $R_{in} > 200 \text{ kohm}$). The analogue inputs are galvanically isolated as a group.
Isolation test voltage	500 VAC, 1 min
Max. common mode voltage between the channels	$\pm 15 \text{ VDC}$
Common mode rejection ratio	$\geq 60 \text{ dB}$ at 50 Hz
Resolution	0.025 % (12 bit) for the -10 V ... +10 V input. 0.5 % (11 bit) for the 0 ... +10 V and 0 ... 20 mA inputs.
Inaccuracy	$\pm 0.5 \%$ (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: $\pm 100 \text{ ppm/}^\circ\text{C}$ ($\pm 56 \text{ ppm/}^\circ\text{F}$), max.

Constant voltage output

Voltage	+10 VDC, 0, -10 VDC $\pm 0.5 \%$ (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: $\pm 100 \text{ ppm/}^\circ\text{C}$ ($\pm 56 \text{ ppm/}^\circ\text{F}$) max.
Maximum load	10 mA
Applicable potentiometer	1 kohm to 10 kohm

Auxiliary power output

Voltage	24 VDC $\pm 10 \%$, short circuit proof
Maximum current	250 mA (shared between this output and optional modules installed on the RMIO)

Analogue outputs

	Two programmable current outputs: 0 (4) to 20 mA, $R_L \leq 700 \text{ ohm}$
Resolution	0.1 % (10 bit)
Inaccuracy	$\pm 1 \%$ (Full Scale Range) at 25 °C (77 °F). Temperature coefficient: $\pm 200 \text{ ppm/}^\circ\text{C}$ ($\pm 111 \text{ ppm/}^\circ\text{F}$) max.

Digital inputs

	With Standard Application Program six programmable digital inputs (common ground: 24 VDC, -15 % to +20 %) and a start interlock input. Group isolated, can be divided in two isolated groups (see <i>Isolation and grounding diagram</i> below). Thermistor input: 5 mA, $< 1.5 \text{ kohm} \hat{=} \text{"1"}$ (normal temperature), $> 4 \text{ kohm} \hat{=} \text{"0"}$ (high temperature), open circuit $\hat{=} \text{"0"}$ (high temperature). Internal supply for digital inputs (+24 VDC): short circuit proof. An external 24 VDC supply can be used instead of the internal supply.
Isolation test voltage	500 VAC, 1 min
Logical thresholds	$< 8 \text{ VDC} \hat{=} \text{"0"}, > 12 \text{ VDC} \hat{=} \text{"1"}$
Input current	DI1 to DI 5: 10 mA, DI6: 5 mA
Filtering time constant	1 ms

Relay outputs

	Three programmable relay outputs
Switching capacity	8 A at 24 VDC or 250 VAC, 0.4 A at 120 VDC
Minimum continuous current	5 mA rms at 24 VDC
Maximum continuous current	2 A rms
Isolation test voltage	4 kVAC, 1 minute

DDCS fibre optic link

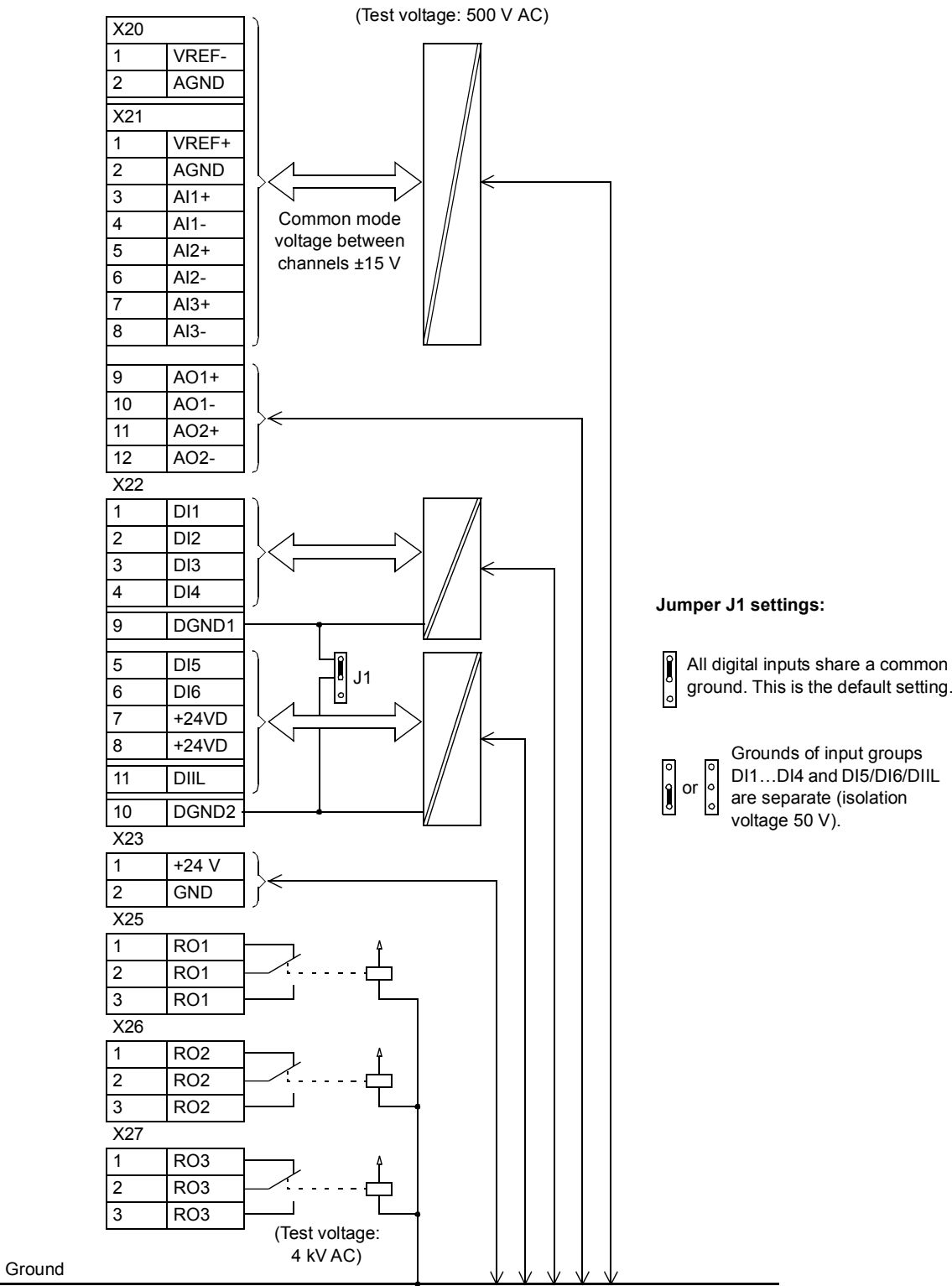
With optional communication adapter module RDCO. Protocol: DDCS (ABB Distributed Drives Communication System)

24 VDC power input

Voltage	24 VDC $\pm$ 10%
Typical current consumption (without optional modules)	250 mA
Maximum current consumption	1200 mA (with optional modules inserted)

The terminals on the RMIO board as well as on the optional modules attachable to the board fulfil the Protective Extra Low Voltage (PELV) requirements stated in EN 50178 provided that the external circuits connected to the terminals also fulfil the requirements, and that the installation site is below 2000 m (6562 ft) in altitude.

Isolation and grounding diagram



Installation checklist

Checklist

Check the mechanical and electrical installation of the drive before start-up. Go through the checklist below together with another person.

Check that...
MECHANICAL INSTALLATION
☐ The ambient operating conditions are allowed. (See <i>Technical data</i> .)
☐ The unit is properly fastened on a non-flammable base. (See <i>Cabinet construction</i> , and separate document <i>ACS800 MultiDrive Modules; Planning the Cabinet Installation</i> [3AFE 64783531, English])
☐ The cooling air is able to flow freely.
☐ The motor and the driven equipment are ready for start. (See <i>Technical data: Motor connection</i> , and separate document <i>ACS800 MultiDrive; Planning the Electrical Installation</i> [3AFE 64783742, English])
ELECTRICAL INSTALLATION (See <i>Electrical installation</i> , and separate document <i>ACS800 MultiDrive Modules; Planning the Cabinet Installation</i> [3AFE 64783531, English])
☐ The capacitors are reformed if stored over one year (refer to <i>ACS 600/800 Capacitor Reforming Guide</i> [64059629, English]).
☐ The module is grounded properly.
☐ The input voltage matches the nominal input voltage of the module.
☐ The power connections at UDC+ and UDC– and their tightening torques are OK.
☐ Appropriate DC fuses are installed.
☐ The motor connections at U2, V2 and W2 and their tightening torques are OK.
☐ The RDCU control unit is loaded with the appropriate application program (see the label on the unit).
☐ R7i and R8i modules with Prevention of unexpected start option only: The voltage selection jumper on the AGPS board is correctly set (230 or 115 V).
☐ Inverter units with parallel-connected modules and an APBU branching unit only: Memory backup battery is enabled on the APBU (actuator 6 of switch S3 is ON).
☐ The motor cable is routed away from other cables.
☐ There are no power factor compensation capacitors in the motor cable.
☐ The external control connections to the inverter unit are OK.

Check that...

- ☐ There are no tools, foreign objects or dust from drilling inside the module or cubicle.
- ☐ All shrouds and covers are in place.
- ☐ The Prevention of unexpected start circuit is completed (See *Electrical installation*).

External +24 V power supply for the RMIO board (Frames R2i to R5i)

What this chapter contains

This chapter describes how to connect external +24 V power supply for the RMIO board.

When to use

External +24 V power supply for the RMIO board is recommended if

- the application requires fast start after connecting the input power supply
- fieldbus communication is required when the input power supply is disconnected.

For current consumption of the RMIO board, see the chapter *Motor Control and I/O Board (RMIO)*.

Parameter settings

In Standard Application Program, set parameter 16.09 CTRL BOARD SUPPLY to EXTERNAL 24V if the RMIO board is powered from an external supply.

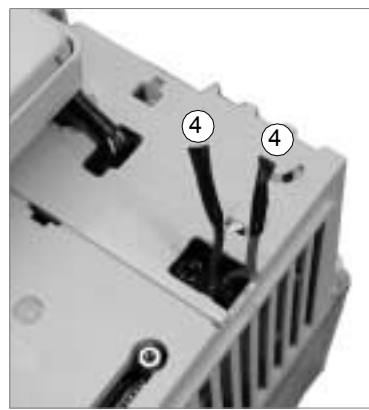
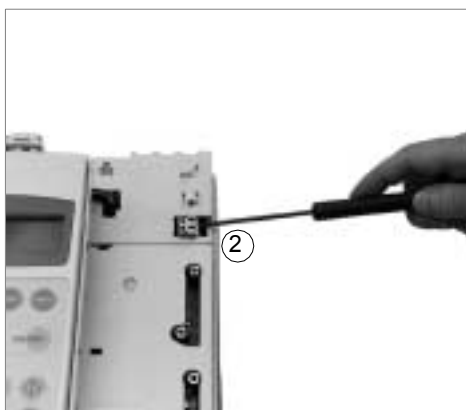
Connecting +24 V external power supply

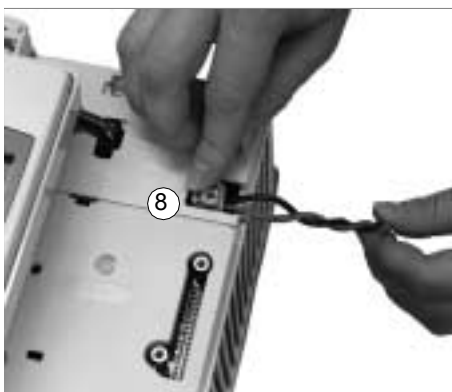
1. Break off the tab covering the +24 VDC power input connector with pliers.
2. Lift the connector upwards.
3. Disconnect the wires from the connector (keep the connector for later use).
4. Isolate the ends of the wires individually with insulating tape.
5. Cover the isolated ends of the wires with insulating tape.
6. Push the wires inside the skeleton.
7. Connect the wires of the +24 V external power supply to the disconnected connector: + wire to terminal 1 and - wire to terminal 2.
8. Plug the connector in.

Frame sizes R2i to R4i



Frame size R5i





Maintenance

What this chapter contains

This chapter contains preventive maintenance instructions, and a description of the LEDs of the drive.

Safety instructions



Only a qualified electrician is allowed to perform the maintenance.

Before starting work on the drive system,

- isolate the drive system from the main supply
- open the switch-disconnectors and lock them out in the open position
- switch off any voltages connected to the I/O terminals
- wait for 5 minutes to let the intermediate circuit capacitors discharge
- ensure there is no dangerous voltage present by measuring the voltage on the input, I/O and intermediate circuit terminals.

Inverter module replacement



WARNING! When replacing an inverter module, make sure the replacement module has exactly the same type code (see the type designation label) as the old module. If it does not, consult ABB for more information.

Maintenance intervals

This table lists the routine maintenance intervals recommended by ABB.

Maintenance	Interval	Instructions
Capacitor reforming	Every year when stored	See <i>Capacitor reforming</i> .
Heatsink temperature check and cleaning	Depending on the dustiness of the environment, every 6 to 12 months	See <i>Heatsinks</i> .
Cabinet air filter check; replacement if necessary	Every year	See <i>Checking and replacing the air filters</i> .
Frame R4i and R5i inverter modules: Change of additional cooling fan	Every 3 years	See <i>Cooling fans</i> .
Frame R8i inverter modules: Check and cleaning of power connections	Every 3 years	See <i>Power connections (R8i)</i> .
Main cooling fan change	Every 6 years	See <i>Cooling fans</i> .
Units with parallel-connected inverter modules: APBU branching unit – Memory backup battery renewal	Every 6 years	Locate the APBU unit. Switch off the power to the unit. Remove cover. Replace battery with a new CR 2032 battery.
Frame R4i and larger inverter modules: capacitor renewal	Every 10 years	See <i>Capacitors</i> .

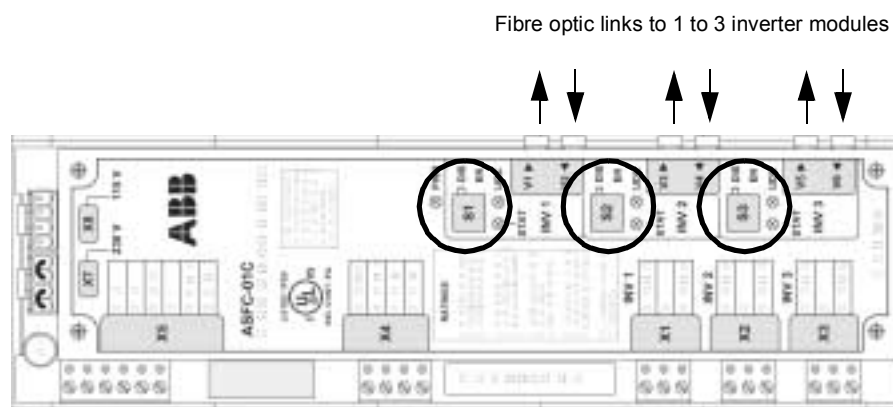
Reduced run capability

Note: This section applies to drives equipped with the APBU branching unit only.

If one of the parallel-connected inverter modules of an inverter unit must be taken out of the cabinet for service, it is possible to continue operation at reduced power using the remaining modules. Follow the steps below.

1. Read and repeat the steps in the safety instructions above.
2. Extract the module to be serviced from the cabinet.
3. Block the airflow through the empty module bay with an air baffle made of sheet metal.

4. Units with DC switch fuses only: On the ASFC switch fuse controller, set the fibre optic link to the absent module to “disabled” using the appropriate switch (S1, S2 or S3).



5. Make the necessary parameter adjustments in the drive firmware. Refer to the appropriate *Firmware Manual*.
6. Reconnect the module after service in reverse order.

Checking and replacing the air filters

Before replacing the air filters of the cabinet, read and repeat the steps in the safety instructions above.

Heatsinks

Heatsink fins pick up dust from the cooling air. Inverter modules run into overtemperature warnings and faults if the heatsink is not clean. In a “normal” environment (not dusty, not clean) the heatsink should be checked annually, in a dusty environment more often.

Clean the heatsink as follows (when necessary):

1. Remove the cooling fan as described in *Cooling fans* elsewhere in this chapter.
2. Blow clean, dry compressed air from bottom to top and simultaneously use a vacuum cleaner at the air outlet to trap the dust. **Note:** Prevent the dust from entering adjoining equipment.
3. Refit the cooling fan.

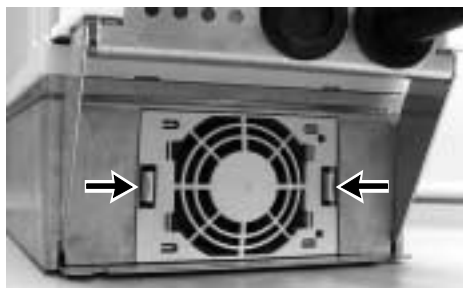
Cooling fans

The cooling fan lifespan is about 50 000 operating hours. The actual lifespan depends on the drive usage and ambient temperature. See the appropriate ACS 800 firmware manual for an actual signal which indicates the hours of usage of the fan.

Fan failure can be predicted by the increasing noise from fan bearings and the gradual rise in the heatsink temperature in spite of heatsink cleaning. If the drive is operated in a critical part of a process, fan replacement is recommended once these symptoms start appearing. Replacement fans are available from ABB. Do not use other than ABB-specified spare parts.

Fan replacement (R2i, R3i)

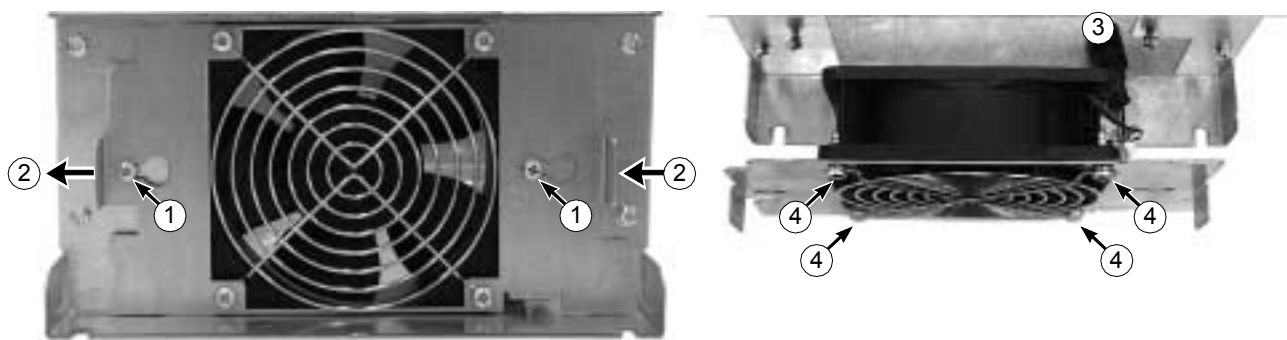
To remove the fan, release the retaining clips. Disconnect the cable. Install the fan in reverse order.



Bottom view

Fan replacement (R4i)

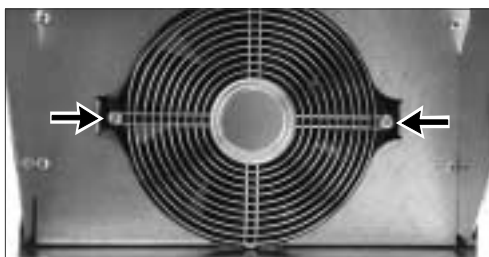
1. Loosen the screws that fasten the fan mounting plate to the frame.
2. Shift the fan mounting plate to the left and pull the fan assembly out.
3. Disconnect the fan power cable.
4. Undo the screws that fasten the fan to the fan mounting plate.
5. Install the new fan in reverse order.



Fan replacement (R5i)

To remove the fan, undo the fixing screws. Disconnect the cable. Install the fan in reverse order.

Bottom view

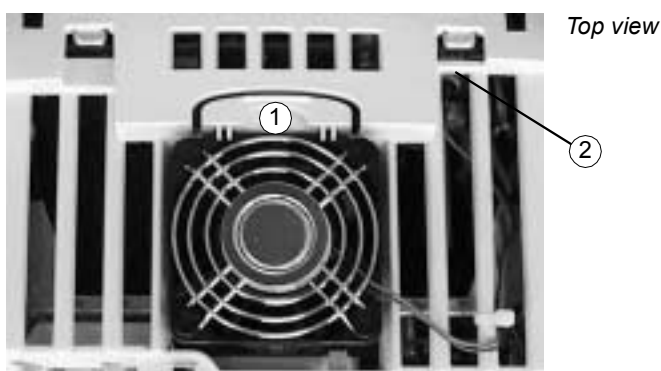


Additional fan

Types -0004-2, 0005-2, -0011-2 to -0020-2, -0006-3, -0009-3, -0020-3 to -0030-3, -0009-5, 0011-5, -0025-5 to -0040-5 have an additional fan.

Replacement (R2i, R3i)

Remove the front cover. To remove the fan, release the retaining clip (1). Disconnect the cable (2, detachable terminal). Install the fan in reverse order.

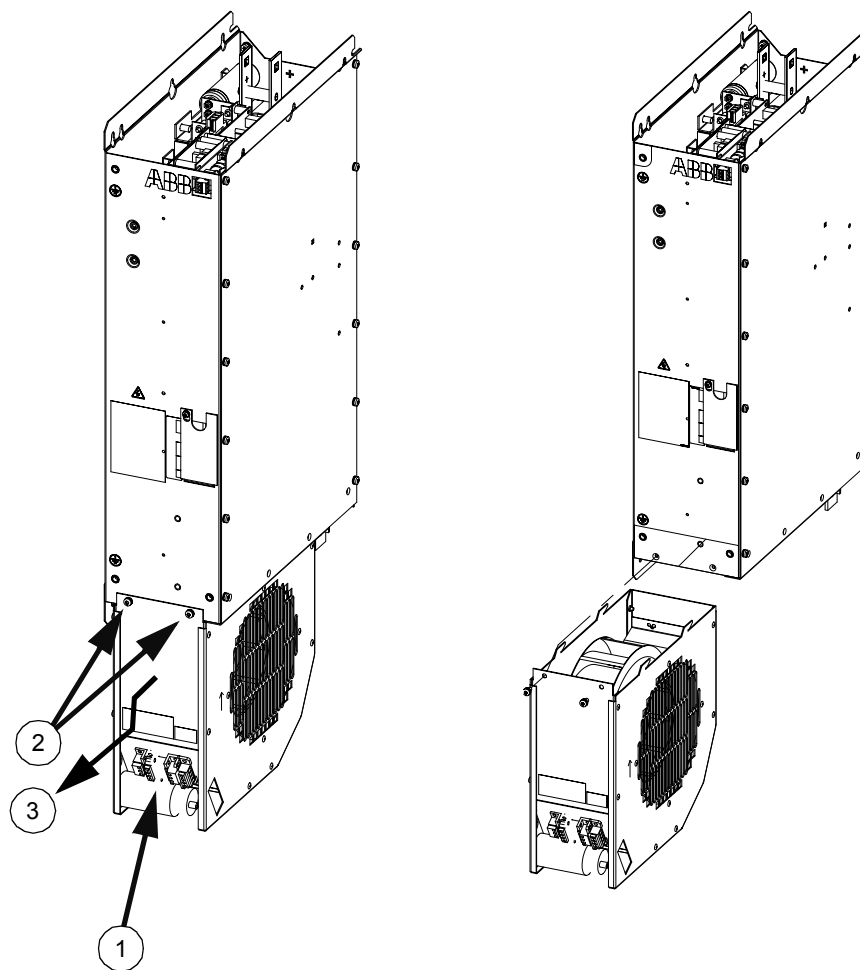


Replacement (R4i, R5i)

Remove the front cover. The fan is located on the lower right-hand side of the unit (R4) or on the right-hand side of the control panel (R5). Lift the fan out and disconnect the cable. Install the fan in reverse order.

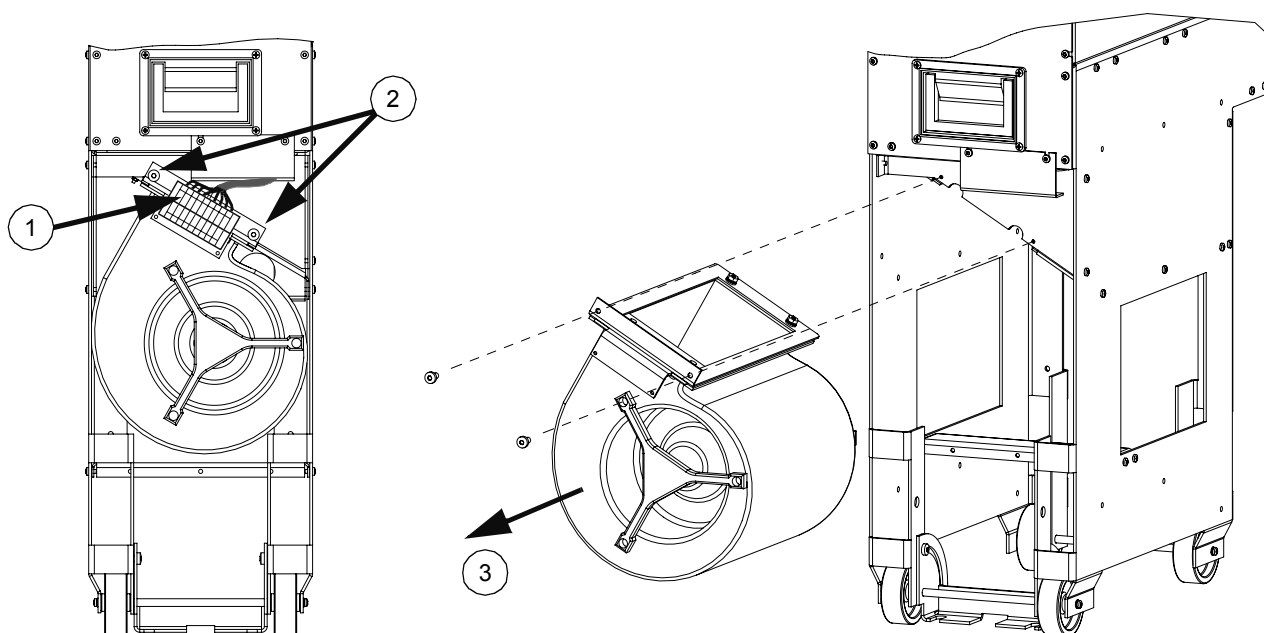
Fan replacement (R7i)

1. Disconnect the wire plug.
2. Remove the two screws holding the fan unit.
3. To free the fan, pull it slightly outwards, then downwards.
4. Install new fan in reverse order.



Fan replacement (R8i)

1. Read and repeat the steps in the safety instructions above.
2. Open the inverter cubicle doors.
3. Disconnect the fan wiring plug (1).
4. Remove the locking screws (2).
5. Pull the fan out along its sliding rails (3).
6. Install a new fan in reverse order.



Power connections (R8i)

1. Read and repeat the steps in the safety instructions above.
2. Open the cabinet doors.
3. Extract one inverter module from the cabinet.
4. Check the tightness of the cable connections at the quick connector. Use the tightening torque table in *Technical data*.
5. Clean all contact surfaces of the quick connector and apply a layer of suitable joint compound (e.g. Isoflex® Topas NB 52 from Klüber Lubrication) onto them.
6. Re-insert the inverter module.
7. Repeat steps 3 to 6 for all remaining R8i inverter modules.

Capacitors

The drive intermediate circuit employs several electrolytic capacitors. Their lifespan is from 45 000 to 90 000 hours depending on drive loading and ambient temperature. Capacitor life can be prolonged by lowering the ambient temperature.

It is not possible to predict a capacitor failure. Capacitor failure is usually followed by a mains fuse failure or a fault trip. Contact ABB if capacitor failure is suspected. Replacements are available from ABB. Do not use other than ABB-specified spare parts.

Capacitor reforming

Reform (re-age) spare part capacitors once a year according to *ACS 600/800 Capacitor Reforming Guide* (code: 64059629).

LEDs

This table describes LEDs of the drive.

Where	LED	When the LED is lit
RMIO board (not visible in frame sizes R2i to R5i)	Red	The drive is in fault state
	Green	The power supply on the board is OK.
Control panel mounting platform	Red	The drive is in fault state
	Green	The main +24 V power supply for the control panel and the RMIO board is OK.
APBU board	TXD (Yellow)	Data is being sent by the APBU to the drive control unit.
	RXD (Yellow)	Data is being received by the APBU from the drive control unit.
	PWR (Green)	APBU logic voltage is OK.
	BAT (Green)	The memory backup battery is OK. The LED is off if the battery is disabled.

ACS800-104 ordering information

What this chapter contains

This chapter lists the components and accessories specific to the ACS800-104 inverter module range.

See the *ACS800 Product Reference* (3AFE 64813340 [English]) for generic equipment for the ACS800 product family such as control panels, I/O options, application programs and PC tools.

Inverter modules

The following tables list the ACS800-104 inverter modules available.

Notes:

- The application program for the modules must be specified when ordering
- Control panel (CDP 312R) is not included
- Frame R7i modules are delivered with either a 115 or 230 V AC cooling fan
- The modules have coated circuit boards as standard equipment.

Frame sizes R2i to R5i

Option key:

+Q950: Prevention of unexpected start (for more information, see the document *ACS800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Inverter modules (R2i to R5i)				
ACS800-104 type	Frame size	$P_{\text{cont.max}}$ (kW)	Order code	
			(no options)	+Q950
$U_N = 400\text{ V (380/400/415 V)}$				
ACS800-104-0003-3	R2i	1.5	64685724	64741730
ACS800-104-0004-3	R2i	2.2	64704338	64751972
ACS800-104-0005-3	R2i	3	64704346	64751999
ACS800-104-0006-3	R2i	4	64704354	64752162
ACS800-104-0009-3	R2i	5.5	64704362	64752243
ACS800-104-0011-3	R3i	7.5	64702262	64752464
ACS800-104-0016-3	R3i	11	64704478	64752529
ACS800-104-0020-3	R3i	15	64704486	64752723
ACS800-104-0025-3	R4i	22	64702271	64752812
ACS800-104-0030-3	R4i	30	64704524	64752855
ACS800-104-0040-3	R5i	37	64702246	64759833
ACS800-104-0050-3	R5i	45	64702254	64759922
ACS800-104-0060-3	R5i	55	64704320	64759965
$U_N = 500\text{ V (380/400/415/440/460/480/500 V)}$				
ACS800-104-0004-5	R2i	2.2	64704419	64752065
ACS800-104-0005-5	R2i	3	64704427	64752111

Inverter modules (R2i to R5i)				
ACS800-104 type	Frame size	$P_{\text{cont.max}}$ (kW)	Order code	
			(no options)	+Q950
ACS800-104-0006-5	R2i	4	64704435	64752146
ACS800-104-0009-5	R2i	5.5	64704443	64752201
ACS800-104-0011-5	R2i	7.5	64704451	64752278
ACS800-104-0016-5	R3i	11	64704494	64752626
ACS800-104-0020-5	R3i	15	64704508	64752707
ACS800-104-0025-5	R3i	18.5	64704516	64752758
ACS800-104-0030-5	R4i	22	64704532	64752839
ACS800-104-0040-5	R4i	30	64704541	64752863
ACS800-104-0050-5	R5i	37	64704567	64759990
ACS800-104-0060-5	R5i	45	64704583	64760033
ACS800-104-0070-5	R5i	55	64704591	64760041
$U_N = 690 \text{ V (525/575/600/660/690 V)}$				
ACS800-104-0011-7	R4i	11	64771116	64772473
ACS800-104-0016-7	R4i	15	64772074	64772481
ACS800-104-0020-7	R4i	18.5	64772082	64772490
ACS800-104-0025-7	R4i	22	64772091	64772503
ACS800-104-0030-7	R4i	30	64772104	64772511
ACS800-104-0040-7	R4i	30	64772171	64772520
ACS800-104-0050-7	R5i	45	64772325	64772538
ACS800-104-0060-7	R5i	55	64772376	64772546

PDM-256538

Frame size R7i

Option key:

+F272: Internal charging circuit. To be selected if the inverter module is connected to the DC bus through a switching component such as a switch fuse.

+G304: Auxiliary voltage is 115 V AC (instead of 230 V AC).

+Q950: Prevention of unexpected start (for more information, see the document *ACS800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Inverter modules (R7i)								
ACS800-104 type	Order code							
	(no options)	+F272	+G304	+Q950	+F272 +G304	+F272 +Q950	+G304 +Q950	+F272 +G304 +Q950
$U_N = 400 \text{ V}$ (380/400/415 V)								
ACS800-104-0105-3	68445396	68446368	68499224	68500257	68499411	68446589	68500729	68499623
ACS800-104-0125-3	68445400	68446384	68499232	68500290	68499437	68446597	68500737	68499631
ACS800-104-0145-3	68445418	68446392	68499241	68500338	68499453	68446601	68500745	68499640
ACS800-104-0175-3	68445426	68446406	68499259	68500346	68499470	68446619	68500753	68499658
$U_N = 500 \text{ V}$ (380/400/415/440/460/480/500 V)								
ACS800-104-0105-5	68445434	68446414	68499275	68500362	68499488	68446627	68500770	68499666
ACS800-104-0125-5	68445442	68446422	68499283	68500435	68499518	68446643	68500800	68499674
ACS800-104-0145-5	68445469	68446449	68499291	68500460	68499526	68446651	68500818	68499682
ACS800-104-0175-5	68445477	68446457	68499305	68500516	68499534	68446660	68500842	68499691
ACS800-104-0215-5	68445485	68446465	68499313	68500567	68499542	68446678	68500851	68499704
$U_N = 690 \text{ V}$ (525/575/600/660/690 V)								
ACS800-104-0075-7	68446295	68446473	68499321	68500583	68499551	68446686	68500869	68499712
ACS800-104-0105-7	68446309	68446481	68499330	68500672	68499577	68446694	68500877	68499721
ACS800-104-0125-7	68446317	68446490	68499348	68500681	68499585	68446708	68500885	68499739
ACS800-104-0145-7	68446325	68446511	68499364	68500699	68499593	68446716	68500893	68499747
ACS800-104-0175-7	68446333	68446538	68499381	68500702	68499607	68446724	68500907	68499755
ACS800-104-0215-7	68446341	68446546	68499399	68500711	68499615	68446732	68500923	68499763

Frame size R8i and multiples

Multiple R8i inverter modules can be connected in parallel to produce higher output powers. The table below shows the quantity and order code of inverter modules required for each inverter unit.

Option key:

+C126: Speed-controlled cooling fan supplied from the DC bus

+E205: du/dt filtering (required for 690 V modules, and parallel-connected modules)

+Q950: Prevention of unexpected start (factory-installed in parallel-connected modules) (for more information, see the document *ACS800 MultiDrive; Planning the Electrical Installation* [3AFE 64783742, English]).

Inverter modules (R8i and multiples)											
Inverter unit type	Order code									Consists of modules of type...	
ACS800-104...	Qty	(no options)	+C126	+E205	+Q950	+C126 +E205	+C126 +Q950	+E205 +Q950	+C126 +E205 +Q950	Qty	ACS800-104-...
$U_N = 400\text{ V}$											
0210-3	1	68262208	68260914	68262356	68262291	68260957	68260931	68262526	68260973	1	0210-3
0260-3	1	68262224	68259231	68262364	68262305	68259746	68259762	68262551	68259754	1	0260-3
0320-3	1	68262232	64766058	68262411	68262313	64766121	64766139	68262577	64766031	1	0320-3
0390-3	1	64694383	64793969	64694367	64694375	64793985	64794001	64694332	64793993	1	0390-3
0510-3	1	64694324	64794019	64694294	64694308	64792580	64794051	64694286	64792598	1	0510-3
0770-3	1	—	—	—	—	—	—	68259410	68259436	2	0390-3
1030-3	1	—	—	—	—	—	—	68259461	68259487	2	0510-3
1540-3	1	—	—	—	—	—	—	68259941	68259975	3	0510-3
2050-3	1	—	—	—	—	—	—	68260027	68260051	4	0510-3
$U_N = 500\text{ V}$											
0260-5	1	68263565	68260990	68263697	68263620	68261031	68261015	68263760	68261066	1	0260-5
0320-5	1	68263581	68259258	68263719	68263638	68259703	68259738	68263816	68259720	1	0320-5
0400-5	1	68263590	64766252	68263727	68263646	64766244	64766236	68263824	64766201	1	0400-5
0460-5	1	64694197	64794124	64650289	64694189	64794159	64794183	64650297	64794167	1	0460-5
0610-5	1	64694162	64794191	64650301	64694154	64794205	64794221	64650319	64794213	1	0610-5
0910-5	1	—	—	—	—	—	—	68260116	68260132	2	0460-5
1210-5	1	—	—	—	—	—	—	68260574	68260591	2	0610-5
1820-5	1	—	—	—	—	—	—	68260612	68260647	3	0610-5
2430-5	1	—	—	—	—	—	—	68260655	68260671	4	0610-5
$U_N = 690\text{ V}$											
0260-7	1	—	—	68263859	—	68259665	—	68263930	68259681	1	0260-7
0320-7	1	—	—	68263875	—	68261082	—	68263956	68261104	1	0320-7
0400-7	1	—	—	68263883	—	64766406	—	68263972	64766309	1	0400-7
0440-7	1	—	—	64650327	—	64793918	—	64650335	64793926	1	0440-7
0580-7	1	—	—	64650343	—	64792571	—	64650351	64794086	1	0580-7
0870-7	1	—	—	—	—	—	—	68260728	68261155	2	0440-7
1160-7	1	—	—	—	—	—	—	68261163	68261198	2	0580-7
1740-7	1	—	—	—	—	—	—	68261201	68261210	3	0580-7
2320-7	1	—	—	—	—	—	—	68261228	68261236	4	0580-7

DC fuses and fuse bases; DC switch fuses

The inverter unit can be connected to the DC bus through either fuses only or a switch fuse. See the chapter *Circuit diagrams*.

Fitting a switch fuse enables the isolation and reconnection of an inverter module even when the DC bus is energised. On the other hand, an external circuit is required for controlled charging of the capacitor bank of the module when the switch fuse is closed. For frame R2i to R7i inverter modules, only the DC fuses are required in addition to the switch fuse kit since the modules contain an internal charging circuit (standard for R2i to R5i, option +G304 for R7i). Frame R8i (and multiples) inverter units require the switch fuse kit, DC fuses, and fuses for the charging circuit.

The tables below specify the DC fuses, DC fuse bases, switch fuse parts, and charging circuit fuses for the ACS800-104 inverter units.

DC fuses and fuse bases/Switch fuse parts for inverter modules												
Module type ACS800-104-...			DC fuse				DC fuse base				Switch fuse parts	
			Qty	Type	Info	Order code	Qty	Type	Info	Order code	Qty	Order code(s)
400 V	500 V	690 V										
0003-3	0004-5		2	170M 1561	25A 660V	10028566	2	SB00-D	160A 690V	68569613	1	64089650*
0004-3	0005-5											
0005-3	0006-5											
0006-3	0009-5											
0009-3	0011-5											
0011-3	0016-5		2	170M 1564	50A 660V	09838767	2	SB00-D	160A 690V	68569613	1	64089650*
0016-3	0020-5											
0020-3	0025-5		2	170M 1566	80A 660V	09838791	2	SB00-D	160A 690V	68569613	1	64089650*
0025-3	0030-5											
0030-3	0040-5		2	170M 1569	160A 660V	10003521	2	SB00-D	160A 690V	68569613	1	64089650*
0040-3	0050-5											
0050-3	0060-5											
0060-3	0070-5		2	170M 1570	200A 660V	10003539	2	SB00-D	160A 690V	68569613	1	64089650*
	0105-5		2	170M 1570	200A 660V	10003539	2	SB00-D	160A 690V	68569613	1	64285165 (Switch fuse OS160D02)
											1	64078488 (Aux. contacts OA1G 10)
0105-3	0125-5		2	170M 3818	350A 660V	10028582	2	SB1-D	250A 690V	68569656	1	68474515 (Switch fuse OS250D02P)
0125-3	0145-5										1	64078488 (Aux. contacts OA1G 10)
0145-3	0175-5		2	170M 3819	400A 690V	10003547	2	SB1-D	250A 690V	68569656	1	68474515 (Switch fuse OS250D02P)
											1	64078488 (Aux. contacts OA1G 10)
0175-3	0215-5		2	170M 6810	630A 690V	10030617	2	SB3-D	630A 690V	68380430	1	35066888 (Switch fuse OESA630D2PL)
											1	10000432 (Aux. contacts OZXK 1)
0210-3	0260-5		2	170M 8545	800A 690V	64786423	2	SB3-D	630A 690V	68380430	1	64808796*
0260-3	0320-5											
0320-3	0400-5		2	170M 8552	1100A 690V	68301564	2	SB3-D	630A 690V	68380430	1	64808796*
0390-3	0460-5		2	170M 8547	1250A 690V	64786512	2	SB3-D	630A 690V	68380430	1	64808796*
0510-3	0610-5		2	170M 8550	1600A 690V	64673734	2	SB3-D	630A 690V	68380430	1	64808796*
0770-3	0910-5		4	170M 8547	1250A 690V	64786512	4	SB3-D	630A 690V	68380430	1	64808800*
1030-3	1210-5		4	170M 8550	1600A 690V	64673734	4	SB3-D	630A 690V	68380430	1	64808800*
1540-3	1820-5		6	170M 8550	1600A 690V	64673734	6	SB3-D	630A 690V	68380430	1	64808826*
2050-3	2430-5		8	170M 8550	1600A 690V	64673734	8	SB3-D	630A 690V	68380430	2	64808800*
	0011-7		2	170M 2674	25A 1000V	10032041	2	SB00-D	160A 690V	68569613	1	64089650*
	0016-7		2	170M 2676	35A 1000V	10033250	2	SB00-D	160A 690V	68569613	1	64089650*
	0020-7											
	0025-7		2	170M 2679	63A 1000V	10029791	2	SB00-D	160A 690V	68569613	1	64089650*
	0030-7											
	0040-7		2	170M 2680	80A 1000V	10029805	2	SB00-D	160A 690V	68569613	1	64089650*
	0050-7											

DC fuses and fuse bases/Switch fuse parts for inverter modules												
Module type ACS800-104-...			DC fuse				DC fuse base				Switch fuse parts	
400 V	500 V	690 V	Qty	Type	Info	Order code	Qty	Type	Info	Order code	Qty	Order code(s)
	0060-7		2	170M 2682	125A 1000V	10029813	2	SB00-D	160A 690V	68569613	1	64089650*
	0075-7		2	170M 2682	125A 1000V	10029813	2	SB00-D	160A 690V	68569613	1	64285165 (Switch fuse OS160D02)
	0105-7		2	170M 4700	200A 1000V	10001731	2	SB1-D	250A 690V	68569656	1	64078488 (Aux. contacts OA1G 10)
	0125-7		2	170M 4700	200A 1000V	10001731	2	SB1-D	250A 690V	68569656	1	68474515 (Switch fuse OS250D02P)
	0145-7		2	170M 6301	315A 1250V	10037158	2	SB3-D	630A 690V	68380430	1	64078488 (Aux. contacts OA1G 10)
	0175-7		2	170M 6301	315A 1250V	10037158	2	SB3-D	630A 690V	68380430	1	35066888 (Switch fuse OESA630D2PL)
	0215-7		2	170M 6303	400A 1250V	10037166	2	SB3-D	630A 690V	68380430	1	10000432 (Aux. contacts OZXX 1)
	0215-7		2	170M 6303	400A 1250V	10037166	2	SB3-D	630A 690V	68380430	1	35066888 (Switch fuse OESA630D2PL)
	0215-7		2	170M 6303	400A 1250V	10037166	2	SB3-D	630A 690V	68380430	1	10000432 (Aux. contacts OZXX 1)
	0260-7		2	170M 8645	630A 1000V	68265541	2	SB3-D	630A 690V	68380430	1	64808796*
	0320-7		2	170M 8646	630A 1000V	68316006	2	SB3-D	630A 690V	68380430	1	64808796*
	0400-7		2	170M 8646	630A 1000V	68316006	2	SB3-D	630A 690V	68380430	1	64808796*
	0440-7		2	170M 8647	800A 1000V	68265568	2	SB3-D	630A 690V	68380430	1	64808842*
	0580-7		2	170M 8650	1000A 1000V	64673769	2	SB3-D	630A 690V	68380430	1	64808842*
	0870-7		4	170M 6203	800A 1250V	10029881	4	SB3-D	630A 690V	68380430	1	64808851*
	1160-7		4	170M 8650	1000A 1000V	64673769	4	SB3-D	630A 690V	68380430	1	64808851*
	1740-7		6	170M 8650	1000A 1000V	64673769	6	SB3-D	630A 690V	68380430	1	64808877*
	2320-7		8	170M 8650	1000A 1000V	64673769	8	SB3-D	630A 690V	68380430	2	64808851*

*Switch fuse kit. For contents, see separate table below.

Switch fuse kit contents	
Order code	Kit contents
64089650	1–Switch Fuse (OESA00-160D2PL) • 1–Mounting Frame for 4 aux. contacts • 4–Aux. Contact (2–NO, 1–NO gold-plated, 1–NC)
64808796	1–Switch Fuse (OESL630/32D02) • 2–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808800	1–Switch Fuse (OESL630/32D04) • 4–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808826	1–Switch Fuse (OESL630/32D06) • 6–Resistor (ZRF 30×167,5) • 1–Switch fuse controller (ASFC-01C)
64808842	1–Switch Fuse (OESL630/32D02) • 2–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)
64808851	1–Switch Fuse (OESL630/32D04) • 4–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)
64808877	1–Switch Fuse (OESL630/32D06) • 6–Resistor (ZRF 30×165) • 1–Switch fuse controller (ASFC-01C)

Charging circuit fuses for inverter modules												
Module type ACS800-104-...			Fuse				Fuse base					
			Qty	Type	Info	Order code	Qty	Type	Info	Order code		
0210-3	0260-5	0260-7	2	170M 2673	20A 1000V	68326435	Fuses to be installed on switch fuse					
0260-3	0320-5	0320-7										
0320-3	0400-5	0400-7										
0390-3	0460-5	0440-7										
0510-3	0610-5	0580-7										
0770-3	0910-5	0870-7	4	170M 2673	20A 1000V	68326435						
1030-3	1210-5	1160-7	6	170M 2673	20A 1000V	68326435						
1540-3	1820-5	1740-7										
2050-3	2430-5	2320-7	8	170M 2673	20A 1000V	68326435						

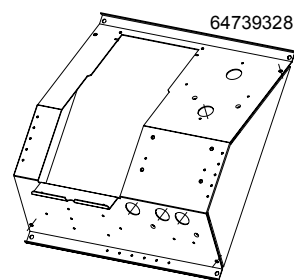
Mounting plates for R2i to R5i modules

Inclined mounting

These are ready-made mounting plates for inclined mounting of frame R2i to R5i inverter modules as exemplified in the chapter *Cabinet construction*.

Dimension drawings of the plates are available from ABB by request.

Inclined mounting plates for R2i to R5i modules	
Frame size	Order code
R2i	64739328
R3i	64739174
R4i	64739344
R5i	64739352

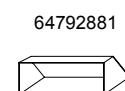
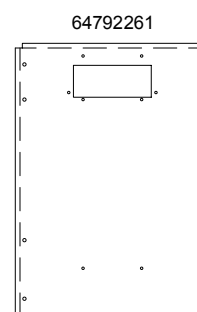


Vertical mounting

These are ready-made mounting plates for vertical mounting of frame R2i to R5i inverter modules as exemplified in the chapter *Cabinet construction*.

Dimension drawings of the parts are available from ABB by request.

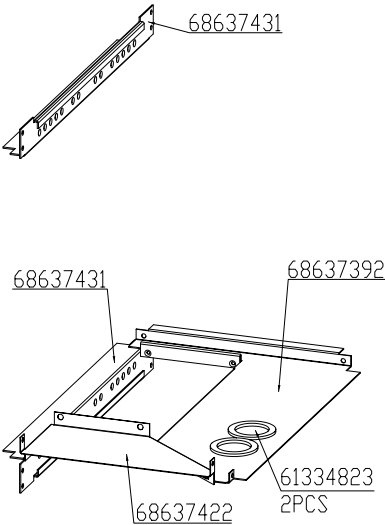
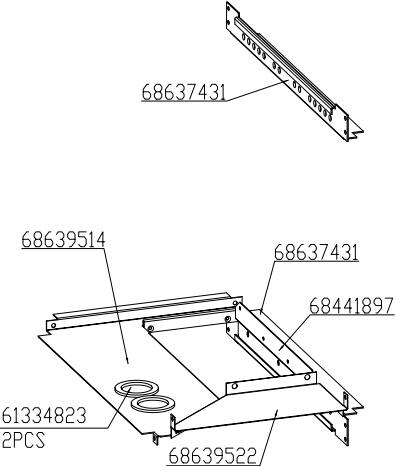
Vertical mounting plates and airflow guides for R2i to R5i modules		
Frame size	Order codes	
	Mounting plate	Airflow guide
R2i	64792261	64792881
R3i	64792270	64792946
R4i	64792288	64792962
R5i	664792296	64792971



Mounting parts for R7i modules

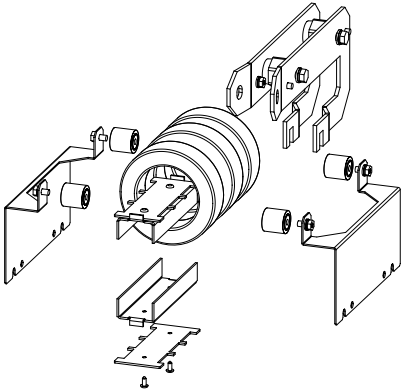
The kits below include the necessary parts for mounting the module on either the left or right side in a Rittal TS 8 cubicle. See also the mounting examples starting on page 30.

Dimension drawings of the sheet metal parts are available from ABB by request.

Rittal TS 8 mounting parts for R7i modules			
Kit	Contents	Quantity	Order code
LH		1 kit per inverter module	68646278
RH		1 kit per inverter module	68646294

Common mode filters for R7i modules

Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing three toroidal cores onto the DC input of the inverter module. A filter kit with mounting parts is available.

Common mode filters for R7i and R8i modules			
Kit	Contents	Quantity	Order code
Common mode filter kit		1 kit per inverter module	68625548

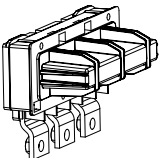
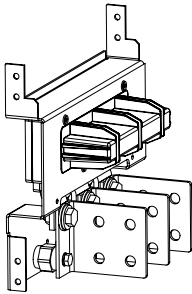
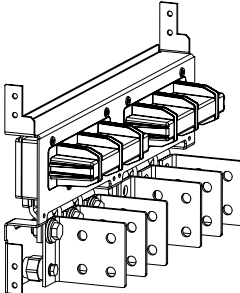
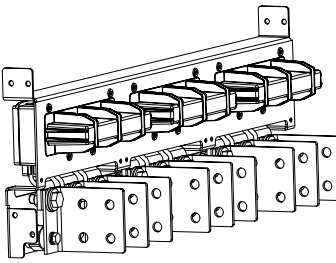
Installation parts for R8i modules

The following tables list the R8i installation parts available from ABB.

Also refer to the drawings in the chapters *Cabinet construction*. Dimension drawings of the sheet metal parts (such as module guides, crossmembers and mounting plates) are available from ABB by request.

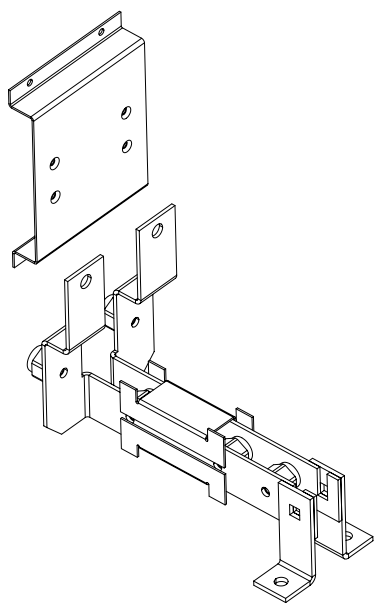
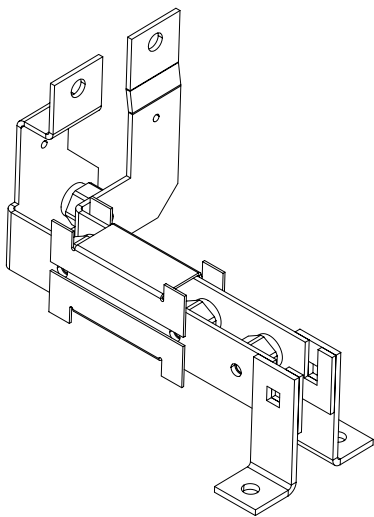
Quick connector chassis socket kits

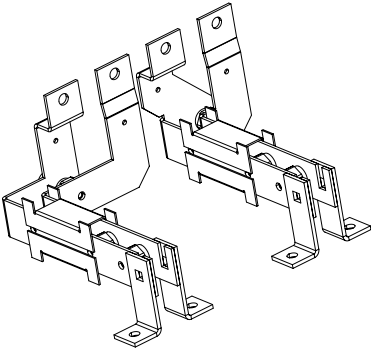
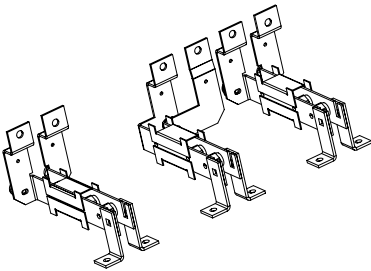
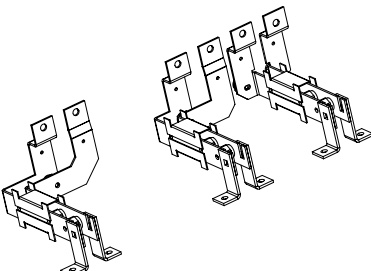
The chassis socket part of the quick connector is to be mounted on the rear pillars of the cubicle. The socket can also be mounted on the back plate.

Quick connector kits for R8i modules			
Kit	For...	Contents of 1 kit	Order code
Connector only	Single R8i module	1 pc Quick connector 	64698401
Connector with mounting parts and output busbars	Single R8i module	1 pc Quick connector 1 pc Mounting plate 3 pcs Output busbar 3 pcs Support insulator 	68239427
	Two R8i modules side by side	2 pcs Quick connector 1 pcs Mounting plate 6 pcs Output busbar 6 pcs Support insulator 	68239435
	Three R8i modules side by side	3 pcs Quick connector 1 pcs Mounting plate 9 pcs Output busbar 9 pcs Support insulator 	68242231
	1 + 2 R8i modules	68239427 + 68239435	68260744

DC busbar kits

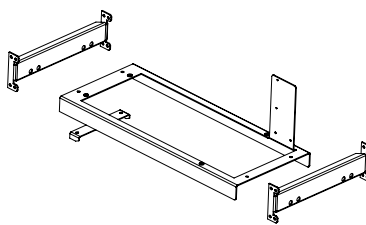
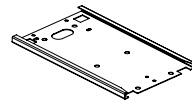
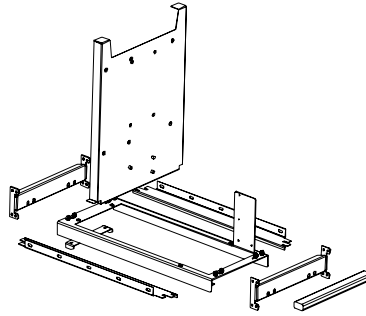
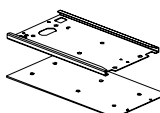
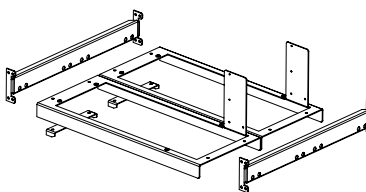
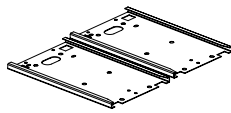
These kits contain the parts needed to connect the DC busbars of the inverter module and the DC switch fuse or DC fuses. The common mode filters (optionally available) are to be installed on the DC busbars.

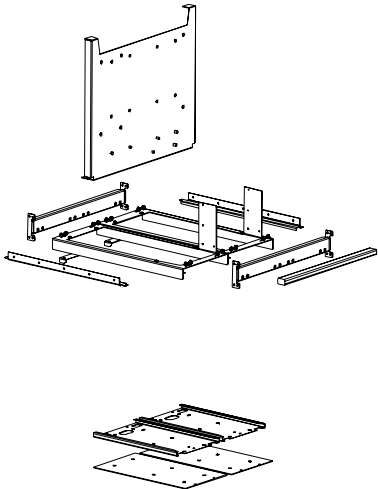
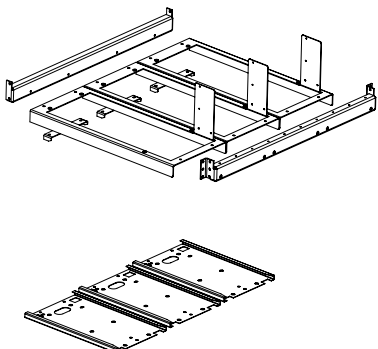
DC busbar kits for R8i modules			
Kit	For...	Contents of 1 kit	Order code
Connecting busbars from fuse bases to DC input of module	Single R8i module	4 pcs Busbar 2 pcs Holder for common mode filters 5 pcs Support insulator 1 pc Mounting plate for fuse bases 	64806823
Connecting busbars from switch fuse (OESL) to DC input of module	Single R8i module (2-pole switch fuse)	4 pcs Busbar 2 pcs Holder for common mode filters 5 pcs Support insulator 	68256747

DC busbar kits for R8i modules			
Kit	For...	Contents of 1 kit	Order code
Connecting busbars from switch fuse (OESL) to DC input of module	Two R8i modules side by side (4-pole switch fuse)	8 pcs Busbar 4 pcs Holder for common mode filters 8 pcs Support insulator 	68256771
	Three R8i modules side by side (6-pole switch fuse)	12 pcs Busbar 6 pcs Holder for common mode filters 15 pcs Support insulator 	68256780
	1 + 2 R8i modules in adjacent Rittal TS 8 cubicles (6-pole switch fuse)	12 pcs Busbar 6 pcs Holder for common mode filters 15 pcs Support insulator 	68260752

Upper and lower guides

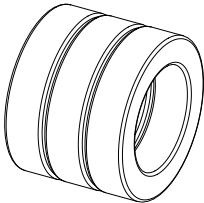
These parts guide the top and bottom of the module when it is being inserted into the cubicle.

Guiding parts kits for R8i modules		
For...	Contents of 1 kit	Order code
Single R8i module	 1 pc Lower guide 1 pc Upper guide 1 pc Upper guide, rear 2 pcs Crossmember 	68256836
Single R8i module in Rittal TS 8 cubicle	 Kit #68256836 and 1 pc Floor plate 1 pc Mounting plate 2 pcs Air baffle 1 pcs EMC sealing, conductive (comes in 2 pieces) 	68283027
Two R8i modules side by side	 2 pcs Lower guide 2 pcs Upper guide 2 pcs Upper guide, rear 2 pcs Crossmember 	68259517

Guiding parts kits for R8i modules		
For...	Contents of 1 kit	Order code
Two R8i modules in a Rittal TS 8 cubicle	Kit #68259517 and 2 pcs Floor plate 1 pc Mounting plate 2 pcs Air baffle 1 pcs EMC sealing, conductive (comes in 3 pieces) 	68283035
Three R8i modules side by side	3 pcs Lower guide 3 pcs Upper guide 3 pcs Upper guide, rear 1 pcs Crossmember, front 1 pcs Crossmember, rear 	68259541
1 + 2 R8i modules in adjacent Rittal TS 8 cubicles	68283027 + 68283035	68260833

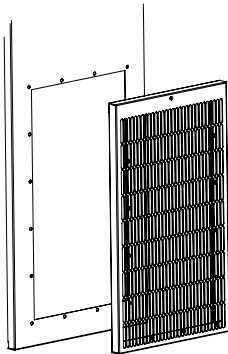
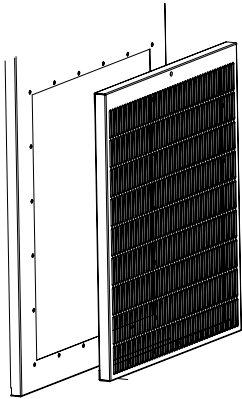
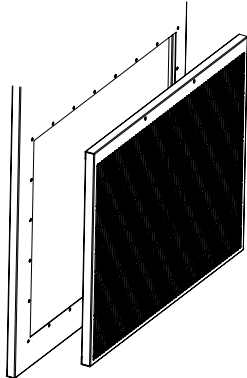
Common mode filters for R8i modules

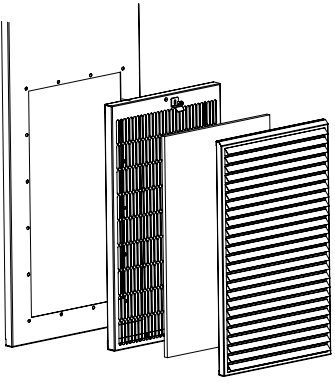
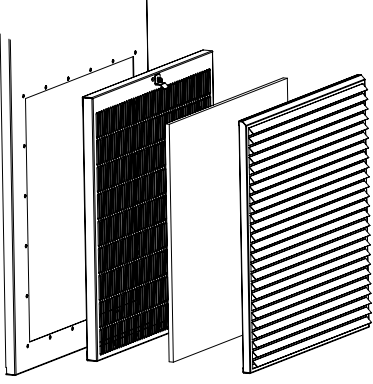
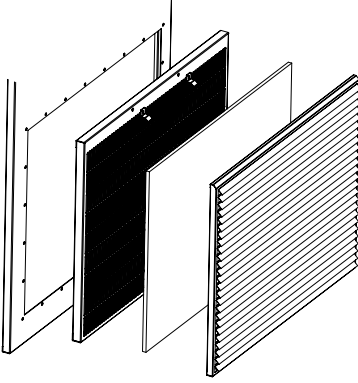
Common mode filtering reduces bearing currents and is required for electromagnetic compatibility (EMC). The filtering is implemented by installing three toroidal cores onto the DC input of each module. The DC busbar sets listed later in this chapter contain holders for the common mode filters.

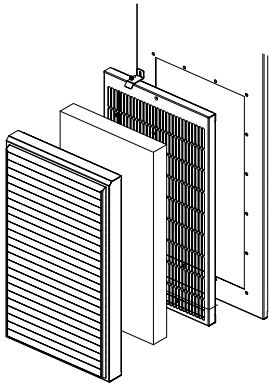
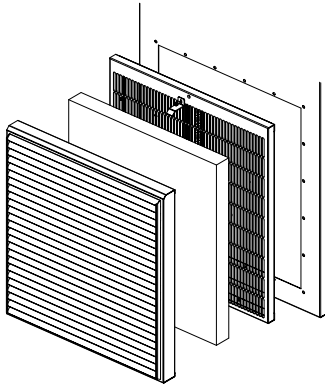
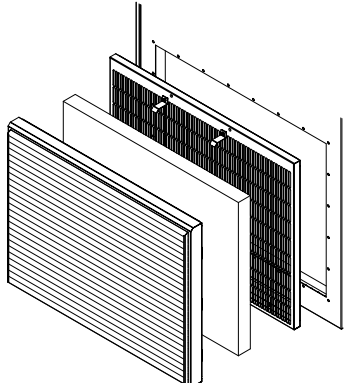
Common mode filters for R7i and R8i modules			
Kit	Contents	Quantity	Order code
Common mode filter kit (toroids only)		1 kit per inverter module	64315811

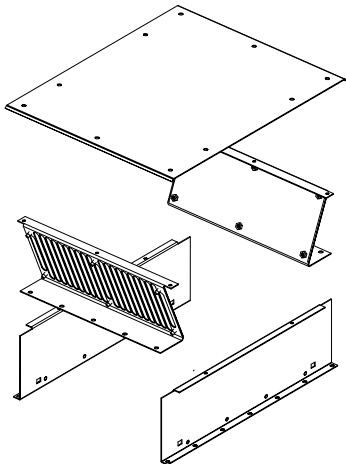
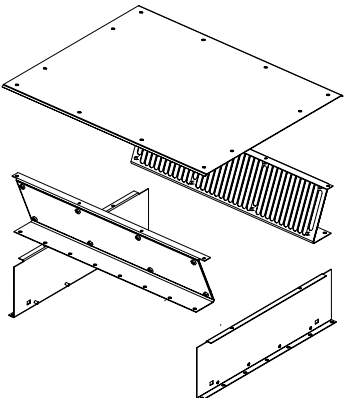
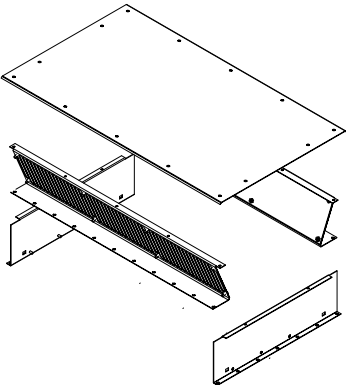
Cabinet ventilation kits

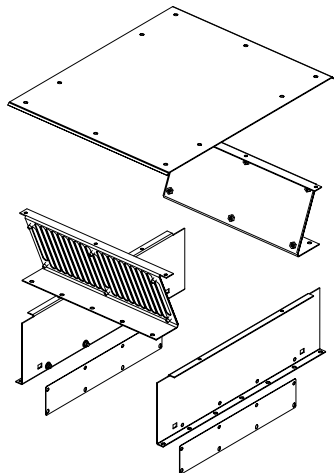
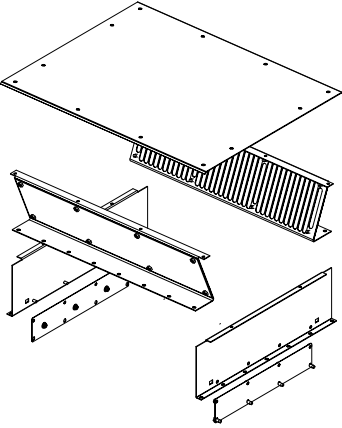
These kits contain air inlet and outlet gratings, filters and fans for different degrees of protection.

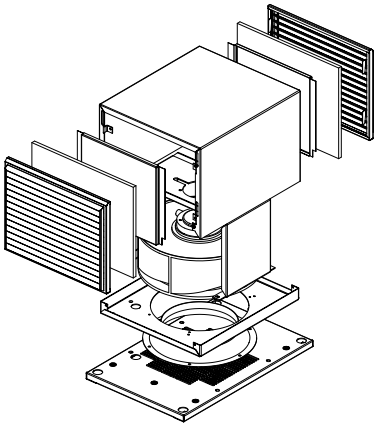
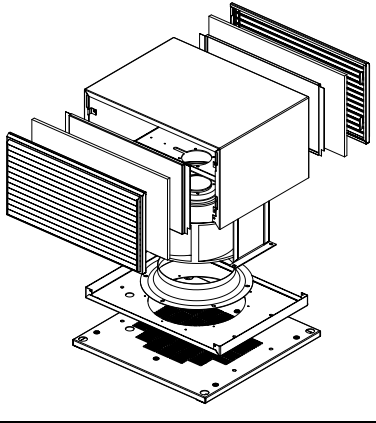
<i>Air inlet kits</i>			
Kit	For...	Contents of 1 kit	Order code
IP20 inlet kit, unfiltered	400 mm wide cubicle. Aperture size: 274 × 522 mm (10.8" × 20.55"). Effective area: 1150 cm ² (180 in ²) approx.	1 pc Grille (metallic) 	68239478
	600 mm wide cubicle. Aperture size: 471 × 522 mm (18.54" × 20.55"). Effective area: 1920 cm ² (295 in ²) approx.	1 pc Grille (metallic) 	68239460
	800 mm wide cubicle. Aperture size: 671 × 522 mm (26.42" × 20.55"). Effective area: 2880 cm ² (445 in ²) approx.	1 pc Grille (metallic) 	68259827
	400 + 600 mm wide cubicles	68239478 + 68239460	68260817
	600 + 800 mm wide cubicles	68239460 + 68259827	68328691
	400 + 2×600 mm wide cubicles	68239478 + 2×68239460	68328705

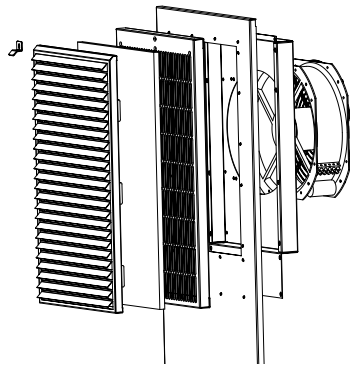
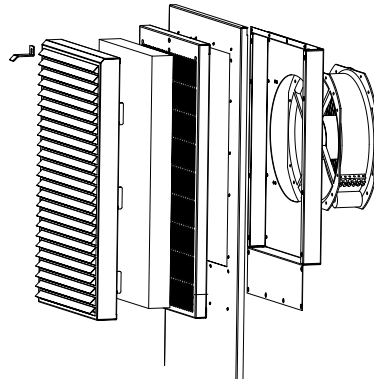
Air inlet kits			
Kit	For...	Contents of 1 kit	Order code
IP42 inlet kit, filtered	400 mm wide cubicle. Aperture size: 274 × 522 mm (10.8" × 20.55"). Effective area: 1150 cm ² (180 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 1 pc Fastener 	68239443
	600 mm wide cubicle. Aperture size: 471 × 522 mm (18.54" × 20.55"). Effective area: 1920 cm ² (295 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 1 pc Fastener 	68239451
	800 mm wide cubicle. Aperture size: 671 × 522 mm (26.42" × 20.55"). Effective area: 2880 cm ² (445 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille, outer (plastic) 2 pcs Fastener 	68259797
	400 + 600 mm wide cubicles	68239443 + 68239451	68260795
	600 + 800 mm wide cubicles	68239451 + 68259797	68328560
	400 + 2×600 mm wide cubicles	68239443 + 2×68239451	68328586

Air inlet kits			
Kit	For...	Contents of 1 kit	Order code
IP54 inlet kit, filtered	400 mm wide cubicle. Aperture size: 274 × 522 mm (10.8" × 20.55"). Effective area: 1150 cm ² (180 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airComp 300-50) 1 pc Grille, outer (plastic) 1 pc Fastener 	68327806
	600 mm wide cubicle. Aperture size: 471 × 522 mm (18.54" × 20.55"). Effective area: 1920 cm ² (295 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airComp 300-50) 1 pc Grille, outer (plastic) 1 pc Fastener 	68327822
	800 mm wide cubicle. Aperture size: 671 × 522 mm (26.42" × 20.55"). Effective area: 2880 cm ² (445 in ²) approx.	1 pc Grille, inner (metallic) 1 pc Filter mat (Luftfilter airComp 300-50) 1 pc Grille, outer (plastic) 2 pcs Fastener 	68328462
	400 + 600 mm wide cubicles	68327806 + 68327822	68327890
	600 + 800 mm wide cubicles	68327822 + 68328462	68328471
	400 + 2×600 mm wide cubicles	68327806 + 2×68327822	68327903

Air outlet kits (Roof)			
Kit	For...	Contents of 1 kit	Order code
IP21/42 generic roof outlet kit	400 mm wide generic cubicle. Aperture size: 314 × 320 mm (12.36" × 12.60"). Effective area: 920 cm ² (140 in ²) approx.	1 pc Roof plate 2 pcs Side plate (L/R) 2 pcs Side plate (Front/Rear) 	68328128
	600 mm wide generic cubicle. Aperture size: 514 × 350 mm (20.24" × 13.78"). Effective area: 1536 cm ² (240 in ²) approx.	1 pc Roof plate 2 pcs Side plate (L/R) 2 pcs Side plate (Front/Rear) 	68328144
	800 mm wide generic cubicle. Aperture size: 714 × 320 mm (28.11" × 12.60"). Effective area: 2304 cm ² (355 in ²) approx.	1 pc Roof plate 2 pcs Side plate (L/R) 2 pcs Side plate (Front/Rear) 	68328446
	600 + 800 mm wide cubicles	68328144 + 68328446	68328608

Air outlet kits (Roof)			
Kit	For...	Contents of 1 kit	Order code
IP21/42 roof outlet kit for Rittal TS 8 cubicles	400 mm wide Rittal TS 8 cubicle. Aperture size: 314 × 320 mm (12.36" × 12.60"). Effective area: 920 cm ² (140 in ²) approx.	1 pc Roof plate 2 pcs Side plate (L/R) 2 pcs Side plate (Front/Rear) 2 pcs Support plate (L/R) 	68328110
	600 mm wide Rittal TS 8 cubicle. Aperture size: 514 × 350 mm (20.24" × 13.78"). Effective area: 1536 cm ² (240 in ²) approx.	1 pc Roof plate 2 pcs Side plate (L/R) 2 pcs Side plate (Front/Rear) 2 pcs Support plate (L/R) 	68328136
	400 + 600 mm wide cubicles	68328110 + 68328136	68328161
	400 + 2×600 mm wide cubicles	68328110 + 2×68328136	68328641

Air outlet kits (Roof)			
Kit	For...	Contents of 1 kit	Order code
IP54 roof outlet kit with fan	400 mm wide cubicle. Aperture size: 314 × 350 mm (12.36" × 13.78")	1 pc Support plate 1 pc Bottom plate 1 pc Support frame 1 pc Cooling fan 1 pc Fan housing 2 pcs Grille (inner) 2 pcs Filter mat (Luftfilter airTex G150) 2 pcs Grille (outer) 	68327831
	600 mm wide cubicle. Aperture size: 514 × 350 mm (20.24" × 13.78")	1 pc Support plate 1 pc Bottom plate 1 pc Support frame 1 pc Cooling fan 1 pc Fan housing 2 pcs Grille (inner) 2 pcs Filter mat (Luftfilter airTex G150) 2 pcs Grille (outer) 	68327857
	400 + 600 mm wide cubicles	68327831 + 68327857	68328519
	600 + 800 mm wide cubicles	68327857 + 2×68327831	68328489

Air outlet kits (Door)			
Kit	For...	Contents of 1 kit	Order code
IP42 door outlet kit with fan	One power module. Aperture size: 274 × 440 mm (10.79" × 17.32")	1 pc Cooling fan 1 pc Support plate 1 pc Grille (inner) 1 pc Filter mat (Luftfilter airTex G150) 1 pc Grille (outer) 1 pc Fastener 	68410711
IP54 door outlet kit with fan	One power module. Aperture size: 274 × 440 mm (10.79" × 17.32")	1 pc Cooling fan 1 pc Support plate 1 pc Grille (inner) 1 pc Filter mat (Luftfilter airComp 300-50) 1 pc Grille (outer) 1 pc Fastener 	68330301

PPCS branching units for n×R8i inverter units

Inverter units consisting of parallel-connected frame R8i inverter modules require PPCS branching units for distribution of control signals to the modules. One branching unit can control up to four inverter modules.

There are two types available – the NPBU-42C is the basic unit; the APBU-44C also incorporates a datalogger and supports redundancy, enabling, in case of removal of one inverter module, continued operation using the remaining modules.

PPCS branching unit (Multiples of frame R8i)						
Inverter unit type ACS800-104...			Quantity	Contents of 1 kit	Order code	
0770-3 1030-3	0910-5 1210-5	0870-7 1160-7	1	1 pc. APBU-44C branching unit & datalogger 2 pcs. 2000 mm fibre optic cables 2 pcs. 3000 mm fibre optic cables	*68242355	
			1	1 pc. NPBU-42C branching unit 2 pcs. 2000 mm fibre optic cables 2 pcs. 3000 mm fibre optic cables	*64349091	
1540-3 2050-3	1820-5 2430-5	1740-7 2320-7	1	1 pc. APBU-44C branching unit & datalogger 4 pcs. 3000 mm fibre optic cables 4 pcs. 5000 mm fibre optic cables	*68242371	
			1	1 pcs. NPBU-42C branching unit 4 pcs. 3000 mm fibre optic cables 4 pcs. 5000 mm fibre optic cables	*64349139	

*Check availability with ABB

Output (du/dt) filters for frame R2i to R7i inverter modules

For information on the usage of output (du/dt) filters, see the document *ACS800 MultiDrive; Planning the Electrical Installation* (3AFE 64783742, English).

Output (du/dt) filters for inverter modules										
Module type ACS800-104-...			Qty	Type	Order code	I _{RMS} (A)	L (μH)	Power loss (W)	Cable size (mm ²)	Connection size
0003-3	0004-5	0011-7	1	NOCH0016-60	58982784	15	150	110	0.2 ... 10	M5
0004-3	0005-5	0016-7								
0005-3	0006-5									
0006-3	0009-5									
0009-3	0011-5									
0011-3	0016-5	0020-7	1	NOCH0030-60	58982792	28	140	167	0.5 ... 16	M5
0016-3	0020-5	0025-7 0030-7								
0020-3	0025-5	0040-7	1	NOCH0070-60	58982806	65	115	210	10 ... 35	M6
0025-3	0030-5	0050-7								
0030-3	0040-5	0060-7								
	0050-5									
0040-3	0060-5	0075-7	1	NOCH0120-60	58982814	105	92	240	–	M8
0050-3	0070-5	0105-7								
0060-3	0105-5	0125-7								
0105-3	0125-5	0145-7	1	FOCH0260-70	68490308	289	35	370	–	M10 (in) M12 (out)
0125-3	0145-5	0175-7								
0145-3	0175-5	0215-7								
0175-3	0215-5									

Other options

See the *ACS800 Multidrive Modules Product Reference* (3AFE 64813340 [English]) for generic equipment for the ACS800 product family such as control panels, I/O options, application programs and PC tools.

Technical data

What this chapter contains

This chapter contains the technical data for the ACS800-104 inverter modules and associated optional equipment.

Ratings

Frame R2i to R7i

Inverter module type	Frame size	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
		$I_{\text{cont,max}}$ A	I_{max} A	$P_{\text{cont,max}}$ kW	I_{2N} A	P_N kW	I_{2hd} A	P_{hd} kW
$U_N = 400 \text{ V}$								
ACS800-104-0003-3	R2i	5.1	6.5	1.5	4.7	1.5	3.4	1.1
ACS800-104-0004-3	R2i	6.5	8.2	2.2	5.9	2.2	4.3	1.5
ACS800-104-0005-3	R2i	8.5	10.8	3	7.7	3.0	5.7	2.2
ACS800-104-0006-3	R2i	10.9	13.8	4	10.2	4.0	7.5	3.0
ACS800-104-0009-3	R2i	13.9	17.6	5.5	12.7	5.5	9.3	4.0
ACS800-104-0011-3	R3i	19	24	7.5	18	7.5	14	5.5
ACS800-104-0016-3	R3i	25	32	11	24	11	19	7.5
ACS800-104-0020-3	R3i	34	46	15	31	15	23	11
ACS800-104-0025-3	R4i	44	62	22	41	18.5	32	15
ACS800-104-0030-3	R4i	55	72	30	50	22	37	18.5
ACS800-104-0040-3	R5i	72	86	37	69	30	49	22
ACS800-104-0050-3	R5i	86	112	45	80	37	60	30
ACS800-104-0060-3	R5i	103	138	55	94	45	69	37
ACS800-104-0105-3	R7i	147	220	75	141	75	110	55
ACS800-104-0125-3	R7i	178	252	90	171	90	133	55
ACS800-104-0145-3	R7i	208	311	110	200	110	156	75
ACS800-104-0175-3	R7i	250	374	132	240	132	187	90
$U_N = 500 \text{ V}$								
ACS800-104-0004-5	R2i	4.9	6.5	2.2	4.5	2.2	3.4	1.5
ACS800-104-0005-5	R2i	6.2	8.2	3	5.6	3.0	4.2	2.2
ACS800-104-0006-5	R2i	8.1	10.8	4	7.7	4.0	5.6	3.0
ACS800-104-0009-5	R2i	10.5	13.8	5.5	10.0	5.5	7.5	4.0
ACS800-104-0011-5	R2i	13.2	17.6	7.5	12.0	7.5	9.2	5.5
ACS800-104-0016-5	R3i	19	24	11	18	11	13	7.5
ACS800-104-0020-5	R3i	25	32	15	23	15	18	11
ACS800-104-0025-5	R3i	34	46	18.5	31	18.5	23	15
ACS800-104-0030-5	R4i	42	62	22	39	22	32	18.5
ACS800-104-0040-5	R4i	48	72	30	44	30	36	22
ACS800-104-0050-5	R5i	65	86	37	61	37	50	30
ACS800-104-0060-5	R5i	79	112	45	75	45	60	37
ACS800-104-0070-5	R5i	96	138	55	88	55	69	45
ACS800-104-0105-5	R7i	115	172	75	110	55	86	55
ACS800-104-0125-5	R7i	135	202	90	130	90	101	55
ACS800-104-0145-5	R7i	166	248	110	159	110	124	75

Inverter module type	Frame size	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
		$I_{\text{cont.max}}$ A	I_{max} A	$P_{\text{cont.max}}$ kW	I_{2N} A	P_N kW	$I_{2\text{hd}}$ A	P_{hd} kW
ACS800-104-0175-5	R7i	208	311	132	200	132	156	90
ACS800-104-0215-5	R7i	250	374	160	240	160	187	110
$U_N = 690 \text{ V}$								
ACS800-104-0011-7	R4i	13	14	11	11.5	7.5	8.5	5.5
ACS800-104-0016-7	R4i	17	19	15	15	11	11	7.5
ACS800-104-0020-7	R4i	22	28	18.5	20	15	15	11
ACS800-104-0025-7	R4i	25	38	22	23	18.5	19	15
ACS800-104-0030-7	R4i	33	44	30	30	22	22	18.5
ACS800-104-0040-7	R4i	36	54	30	34	30	27	22
ACS800-104-0050-7	R5i	51	68	45	46	37	34	30
ACS800-104-0060-7	R5i	57	84	55	52	45	42	37
ACS800-104-0075-7	R7i	69	103	55	66	55	52	45
ACS800-104-0105-7	R7i	88	132	75	84	75	66	55
ACS800-104-0125-7	R7i	105	157	90	101	90	79	75
ACS800-104-0145-7	R7i	132	197	110	127	110	99	90
ACS800-104-0175-7	R7i	150	224	132	144	132	112	90
ACS800-104-0215-7	R7i	170	254	160	163	160	127	110

Frame R8i and multiples

Inverter unit type	Frame size	Inverter modules used	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
			$I_{\text{cont.max}}$ A	I_{max} A	$P_{\text{cont.max}}$ kW	I_{2N} A	P_N kW	$I_{2\text{hd}}$ A	P_{hd} kW
$U_N = 400 \text{ V}$									
ACS800-104-0210-3	1×R8i	ACS800-104-0210-3	292	400	160	280	132	218	110
ACS800-104-0260-3	1×R8i	ACS800-104-0260-3	370	506	200	355	200	277	132
ACS800-104-0320-3	1×R8i	ACS800-104-0320-3	469	642	250	450	250	351	200
ACS800-104-0390-3	1×R8i	ACS800-104-0390-3	565	773	315	542	300	423	220
ACS800-104-0510-3	1×R8i	ACS800-104-0510-3	741	1014	400	711	400	554	315
ACS800-104-0770-3	2×R8i	ACS800-104-0390-3	1111	1521	630	1067	560	831	450
ACS800-104-1030-3	2×R8i	ACS800-104-0510-3	1452	1988	900	1394	710	1086	560
ACS800-104-1540-3	3×R8i	ACS800-104-0510-3	2156	2951	1250	2070	1120	1613	900
ACS800-104-2050-3	4×R8i	ACS800-104-0510-3	2845	3894	1600	2731	1600	2128	1120
$U_N = 500 \text{ V}$									
ACS800-104-0260-5	1×R8i	ACS800-104-0260-5	315	457	200	302	200	236	132
ACS800-104-0320-5	1×R8i	ACS800-104-0320-5	365	530	250	350	250	273	160
ACS800-104-0400-5	1×R8i	ACS800-104-0400-5	455	660	315	437	315	340	200
ACS800-104-0460-5	1×R8i	ACS800-104-0460-5	525	762	355	504	355	393	250
ACS800-104-0610-5	1×R8i	ACS800-104-0610-5	700	1016	500	672	450	524	355
ACS800-104-0910-5	2×R8i	ACS800-104-0460-5	1050	1524	710	1008	710	785	500
ACS800-104-1210-5	2×R8i	ACS800-104-0610-5	1372	1991	900	1317	900	1026	710
ACS800-104-1820-5	3×R8i	ACS800-104-0610-5	2037	2956	1400	1956	1400	1524	1120
ACS800-104-2430-5	4×R8i	ACS800-104-0610-5	2688	3901	2000	2580	1800	2011	1400
$U_N = 690 \text{ V}$									
ACS800-104-0260-7	1×R8i	ACS800-104-0260-7	215	322	200	206	200	161	132
ACS800-104-0320-7	1×R8i	ACS800-104-0320-7	289	432	250	277	250	216	160
ACS800-104-0400-7	1×R8i	ACS800-104-0400-7	336	503	315	323	315	251	200
ACS800-104-0440-7	1×R8i	ACS800-104-0440-7	382	571	355	367	355	286	250
ACS800-104-0580-7	1×R8i	ACS800-104-0580-7	486	727	450	467	450	364	315
ACS800-104-0870-7	2×R8i	ACS800-104-0440-7	729	1091	710	700	710	545	500

Inverter unit type	Frame size	Inverter modules used	Nominal ratings		No-overload use	Light-overload use		Heavy-duty use	
			$I_{\text{cont.max}}$ A	I_{max} A	$P_{\text{cont.max}}$ kW	I_{2N} A	P_N kW	$I_{2\text{hd}}$ A	P_{hd} kW
ACS800-104-1160-7	2xR8i	ACS800-104-0580-7	953	1425	900	914	900	713	630
ACS800-104-1740-7	3xR8i	ACS800-104-0580-7	1414	2116	1400	1358	1400	1058	900
ACS800-104-2320-7	4xR8i	ACS800-104-0580-7	1866	2792	1800	1792	1800	1396	1400

PDM-00184674

Symbols

Nominal ratings

$I_{\text{cont.max}}$ Continuous RMS output current. No overloadability at 40 °C.

I_{max} Maximum output current. Allowable for 10 seconds at start, otherwise as long as allowed by drive temperature. **Note:** Maximum motor shaft power is 150% P_{hd} .

Typical ratings for no-overload use

$P_{\text{cont.max}}$ Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Typical ratings for light-overload use (10% overloadability)

I_{2N} Continuous rms current. 10% overload is allowed for 1 minute every 5 minutes.

P_N Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Typical ratings for heavy-duty use (50% overloadability)

$I_{2\text{hd}}$ Continuous rms current. 50% overload is allowed for 1 minute every 5 minutes.

P_{hd} Typical motor power. The power ratings apply to most IEC 34 motors at nominal voltage (400, 500 or 690 V).

Derating

The load capacity (current and power) decreases if the installation site altitude exceeds 1000 metres (3300 ft), or if the ambient temperature exceeds 40 °C (104 °F).

Temperature derating

In the temperature range +40 °C (+104 °F) to +50 °C (+122 °F) the rated output current is decreased 1 % for every additional 1 °C (1.8 °F). The output current is calculated by multiplying the current given in the rating table by the derating factor.

Example If the ambient temperature is +50 °C (+122 °F) the derating factor is $100\% - 1 \frac{\%}{^{\circ}\text{C}} \cdot 10^{\circ}\text{C} = 90\%$ or 0.90. The output current is then $0.90 \cdot I_{2N}$ or $0.90 \cdot I_{2\text{hd}}$.

Note: $I_{\text{cont.max}}$ rating is not allowed above 40 °C (104 °F).

Altitude derating

In altitudes from 1000 to 4000 m (3300 to 13123 ft) above sea level, the derating is 1% for every 100 m (328 ft). For a more accurate derating, use the *DriveSize* PC tool. If the installation site is higher than 2000 m (6600 ft) above sea level, please contact your local ABB distributor or office for further information.

Dimensions, noise, DC capacitance

Inverter module/unit type	Frame size	Height	Width	Depth	Weight	Noise level	DC capacitance
		mm (in.)	mm (in.)	mm (in.)	kg (lbs)	dBA	μF
U _N = 400 V							
ACS800-104-0003-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0004-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0005-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0006-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0009-3	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0011-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0016-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0020-3	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0025-3	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0030-3	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0040-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0050-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0060-3	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2400
ACS800-104-0105-3	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	4100
ACS800-104-0125-3	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0145-3	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0175-3	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0210-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0260-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0320-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	10250
ACS800-104-0390-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	12300
ACS800-104-0510-3	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	14350
ACS800-104-0770-3	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	24600
ACS800-104-1030-3	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	28700
ACS800-104-1540-3	3×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	43050
ACS800-104-2050-3	4×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	57400
U _N = 500 V							
ACS800-104-0004-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0005-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0006-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0009-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0011-5	R2i	401 (15.79)	165 (6.50)	*193 (7.60)	9 (20)	62	350
ACS800-104-0016-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0020-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0025-5	R3i	466 (18.35)	173 (6.81)	*232 (9.13)	12 (26)	62	820
ACS800-104-0030-5	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0040-5	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	1000
ACS800-104-0050-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0060-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2000
ACS800-104-0070-5	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	2400
ACS800-104-0105-5	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	4100
ACS800-104-0125-5	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0145-5	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0175-5	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0215-5	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	6150
ACS800-104-0260-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200
ACS800-104-0320-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	8200

Inverter module/unit type	Frame size	Height	Width	Depth	Weight	Noise level	DC capacitance
		mm (in.)	mm (in.)	mm (in.)	kg (lbs)	dBA	μF
ACS800-104-0400-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	10250
ACS800-104-0460-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	12300
ACS800-104-0610-5	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	14350
ACS800-104-0910-5	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	24600
ACS800-104-1210-5	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	28700
ACS800-104-1820-5	3×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	43050
ACS800-104-2430-5	4×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	57400
$U_N = 690 \text{ V}$							
ACS800-104-0011-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0016-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0020-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0025-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0030-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0040-7	R4i	525 (20.67)	240 (9.45)	*252 (9.92)	15 (33)	62	670
ACS800-104-0050-7	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	1330
ACS800-104-0060-7	R5i	673 (26.50)	265 (10.43)	*276 (10.87)	23 (51)	65	1330
ACS800-104-0075-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	1530
ACS800-104-0105-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	3070
ACS800-104-0125-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	3070
ACS800-104-0145-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	3070
ACS800-104-0175-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	3070
ACS800-104-0215-7	R7i	966 (38.03)	170 (6.69)	408 (16.06)	38 (84)	72	3070
ACS800-104-0260-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	4600
ACS800-104-0320-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	6130
ACS800-104-0400-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	6130
ACS800-104-0440-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	7670
ACS800-104-0580-7	1×R8i	1397 (55.00)	245 (9.65)	596 (23.46)	150 (330)	72	9200
ACS800-104-0870-7	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	15330
ACS800-104-1160-7	2×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	74	18400
ACS800-104-1740-7	3×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	27600
ACS800-104-2320-7	4×R8i	**1397 (55.00)	**245 (9.65)	**596 (23.46)	**150 (330)	76	36800

*Excluding control panel (optional)

**Single module only

Power loss and cooling characteristics

See the dimensional drawings for free space requirements.

Inverter module/ unit type	Frame size	Power loss	Nominal air flow	Minimum effective area of air inlet		Minimum effective area of air outlet		Max. pressure drop of cabinet at nominal air flow
				unfiltered	with Luftfilter/ airTex G150	unfiltered	with Luftfilter/ airTex G150	
		W (Btu/h)	m³/h (ft³/min)	cm² (in²)	cm² (in²)	cm² (in²)	cm² (in²)	Pa
U _N = 400 V								
ACS800-104-0003-3	R2i	80 (280)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0004-3	R2i	100 (340)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0005-3	R2i	110 (380)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0006-3	R2i	130 (450)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0009-3	R2i	160 (550)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0011-3	R3i	200 (680)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0016-3	R3i	270 (920)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0020-3	R3i	350 (1200)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0025-3	R4i	420 (1440)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0030-3	R4i	490 (1680)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-3	R5i	650 (2220)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0050-3	R5i	790 (2700)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-3	R5i	950 (3250)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0105-3	R7i	1400 (4780)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0125-3	R7i	1700 (5810)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0145-3	R7i	1900 (6490)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0175-3	R7i	2100 (7170)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0210-3	1×R8i	2700 (9220)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0260-3	1×R8i	3700 (12700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-3	1×R8i	4900 (16700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0390-3	1×R8i	6100 (20800)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0510-3	1×R8i	8000 (27300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0770-3	2×R8i	12000 (41000)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1030-3	2×R8i	15000 (51200)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1540-3	3×R8i	23000 (78600)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2050-3	4×R8i	30000 (102500)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180
U _N = 500 V								
ACS800-104-0004-5	R2i	100 (340)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0005-5	R2i	110 (380)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0006-5	R2i	130 (450)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0009-5	R2i	160 (550)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0011-5	R2i	200 (680)	35 (21)	100 (16)	200 (31)	160 (25)	320 (50)	12
ACS800-104-0016-5	R3i	270 (920)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0020-5	R3i	350 (1200)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0025-5	R3i	420 (1440)	69 (41)	200 (31)	400 (62)	320 (50)	640 (99)	12
ACS800-104-0030-5	R4i	490 (1680)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-5	R4i	650 (2220)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0050-5	R5i	790 (2700)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-5	R5i	950 (3250)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0070-5	R5i	1150 (3930)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0105-5	R7i	1100 (3760)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0125-5	R7i	1300 (4440)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0145-5	R7i	1700 (5810)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150

Inverter module/ unit type	Frame size	Power loss	Nominal air flow	Minimum effective area of air inlet		Minimum effective area of air outlet		Max. pressure drop of cabinet at nominal air flow
				unfiltered	with Lufffilter/ airTex G150	unfiltered	with Lufffilter/ airTex G150	
		W (Btu/h)	m ³ /h (ft ³ /min)	cm ² (in ²)	cm ² (in ²)	cm ² (in ²)	cm ² (in ²)	
ACS800-104-0175-5	R7i	2000 (6830)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0215-5	R7i	2200 (7510)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0260-5	1×R8i	3200 (10900)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-5	1×R8i	4000 (13700)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0400-5	1×R8i	5400 (18400)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0460-5	1×R8i	5900 (20100)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0610-5	1×R8i	7800 (26600)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0910-5	2×R8i	12000 (41000)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1210-5	2×R8i	15000 (51200)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1820-5	3×R8i	22000 (75100)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2430-5	4×R8i	29000 (99000)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180
$U_N = 690\text{ V}$								
ACS800-104-0011-7	R4i	300 (1030)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0016-7	R4i	340 (1160)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0020-7	R4i	440 (1500)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0025-7	R4i	530 (1810)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0030-7	R4i	610 (2080)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0040-7	R4i	690 (2360)	103 (61)	300 (47)	600 (93)	480 (74)	960 (149)	12
ACS800-104-0050-7	R5i	840 (2870)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0060-7	R5i	1010 (3450)	250 (147)	400 (62)	800 (124)	640 (99)	1280 (198)	17
ACS800-104-0075-7	R7i	1100 (3760)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0105-7	R7i	1300 (4440)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0125-7	R7i	1600 (5460)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0145-7	R7i	2000 (6830)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0175-7	R7i	2300 (7850)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0215-7	R7i	2600 (8880)	800 (470)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0260-7	1×R8i	3600 (12300)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0320-7	1×R8i	4800 (16400)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0400-7	1×R8i	6100 (20800)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0440-7	1×R8i	7000 (23900)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0580-7	1×R8i	7500 (25600)	1280 (750)	575 (90)	1150 (180)	920 (140)	1840 (290)	150
ACS800-104-0870-7	2×R8i	13000 (44400)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1160-7	2×R8i	15000 (51200)	2560 (1510)	960 (150)	1920 (295)	1536 (240)	3072 (475)	180
ACS800-104-1740-7	3×R8i	22000 (75100)	3840 (2260)	1440 (225)	2880 (445)	2304 (355)	4608 (715)	180
ACS800-104-2320-7	4×R8i	29000 (99000)	5120 (3010)	1920 (295)	3840 (595)	3072 (475)	6144 (950)	180

Cable terminals

DC input and motor cable terminal sizes, accepted cable diameters and tightening torques are given below.

Frame size	UDC+, UDC-, U2, V2, W2						Earthing PE			
	Max. wire size		Cable Ø		Tightening torque		Maximum wire size		Tightening torque	
	mm ²	AWG	mm	in.	Nm	lbf.ft	mm ²	AWG	Nm	lbf.ft
R2i	16*	6 AWG	21	0.83	1.2...1.5	0.9...1.1	10	8	1.5	1.1
R3i	16*	6 AWG	29	1.14	1.2...1.5	0.9...1.1	10	8	1.5	1.1
R4i	25	4 AWG	35	1.38	2...4	1.5...3.0	16	5	3.0	2.2
R5i	70	2/0 AWG	35	1.38	15	11.1	70	2/0	15	11.1

Frame size	DC terminals	Motor output terminals
R7i		
R8i	M12 Tightening torque: 50 Nm (37 lbf.ft) Max. intrusion into module: 20 mm (0.8").	Busbars to quick connector: M12. Tightening torque: 50 Nm (37 lbf.ft) Busbars to support insulators: M8. Tightening torque: 9 Nm (6.5 lbf.ft) Cables to busbars: M12. Tightening torque: 70 Nm (52 lbf.ft)

* 16 mm² rigid solid cable, 10 mm² flexible stranded cable

Input power connection

Voltage	510...560 V DC for 400 V units 510...675 V DC for 500 V units 710...930 V DC for 690 V units
----------------	--

Motor connection

Voltage (U_2)	0 to U_1 , 3-phase symmetrical, $U_{\max}$ at the field weakening point
Frequency	DTC mode: 0 to $3.2 \times f_{\text{FWP}}$. Maximum frequency 300 Hz.

$$f_{\text{FWP}} = \frac{U_{\text{Nmains}}}{U_{\text{Nmotor}}} \times f_{\text{Nmotor}}$$

f_{FWP} : frequency at field weakening point; U_{Nmains} : mains (input power) voltage;
 U_{Nmotor} : rated motor voltage; f_{Nmotor} : rated motor frequency

Frequency resolution

0.01 Hz

Current

See *Ratings* starting on page 129.

Power limit

$1.5 \times P_{\text{hd}}$

Field weakening point

8 to 300 Hz

Switching frequency

3 kHz (average). In 690 V units 2 kHz (average).

Maximum recommended motor cable length

Sizing method	Max. motor cable length	
	Motor control mode: DTC	Motor control mode: Scalar
according to I_{2N} and I_{2hd}		
according to $I_{\text{cont.max}}$ in ambient temperatures below 30 °C (86 °F)	R2i to R3: 100 m (328 ft) R4i to R5i: 300 m (984 ft)	R2i: 150 m (492 ft) R3i to R5i: 300 m (984 ft)
according to $I_{\text{cont.max}}$ in ambient temperatures above 30 °C (86 °F)	R2i: 50 m (164 ft) R3i and R4i: 100 m (328 ft) R5i: 150 m (492 ft)	
—	R7i: 300 m (984 ft) R8i: 500 m (1640 ft)	

Note: With cables longer than 100 m, the EMC Directive requirements may not be fulfilled.

Efficiency

Approximately 98% at nominal power level

Degree of protection

IP00

Ambient conditions

Environmental limits for the drive are given below. The drive is to be used in a heated, indoor, controlled environment.

	Operation installed for stationary use	Storage in the protective package	Transportation in the protective package
Installation site altitude	0 to 4000 m (13123 ft) above sea level [above 1000 m (3281 ft), see <i>Derating</i> on page 131].	-	-
Air temperature	0 to +50 °C (32 to 122 °F). No frost allowed. See <i>Derating</i> on page 131.	-40 to +70 °C (-40 to +158 °F)	-40 to +70 °C (-40 to +158 °F)
Relative humidity	5 to 95% No condensation allowed. Maximum allowed relative humidity is 60% in the presence of corrosive gases.	Max. 95%	Max. 95%
Contamination levels (IEC 60721-3-3, IEC 60721-3-2, IEC 60721-3-1)	No conductive dust allowed.		
	Boards without coating: Chemical gases: Class 3C1 Solid particles: Class 3S2 Boards with coating: Chemical gases: Class 3C2 Solid particles: Class 3S2	Boards without coating: Chemical gases: Class 1C2 Solid particles: Class 1S3 Boards with coating: Chemical gases: Class 1C2 Solid particles: Class 1S3	Boards without coating: Chemical gases: Class 2C2 Solid particles: Class 2S2 Boards with coating: Chemical gases: Class 2C2 Solid particles: Class 2S2
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres	70 to 106 kPa 0.7 to 1.05 atmospheres	60 to 106 kPa 0.6 to 1.05 atmospheres
Vibration (IEC 60068-2)	Max. 1 mm (0.04 in.) (5 to 13.2 Hz), max. 7 m/s ² (23 ft/s ²) (13.2 to 100 Hz) sinusoidal	Max. 1 mm (0.04 in.) (5 to 13.2 Hz), max. 7 m/s ² (23 ft/s ²) (13.2 to 100 Hz) sinusoidal	Max. 3.5 mm (0.14 in.) (2 to 9 Hz), max. 15 m/s ² (49 ft/s ²) (9 to 200 Hz) sinusoidal
Shock (IEC 60068-2-29)	Not allowed	Max. 100 m/s ² (330 ft./s ²), 11 ms	Max. 100 m/s ² (330 ft./s ²), 11 ms
Free fall	Not allowed	250 mm (10 in.) for weight under 100 kg (220 lb) 100 mm (4 in.) for weight over 100 kg (220 lb)	250 mm (10 in.) for weight under 100 kg (220 lb) 100 mm (4 in.) for weight over 100 kg (220 lb)

Materials

Module	- PC/ABS 2.5 mm, colour NCS 1502-Y (RAL 90021 / PMS 420 C) - hot-dip zinc coated steel sheet 1.5 to 2 mm, thickness of coating 100 micrometres - cast aluminium AlSi (R2i and R3i) - extruded aluminium AlSi (R4i and R5i)
Packaging	Corrugated cardboard (frames R2i to R5i and option modules), expanded polystyrene. Plastic covering of the package: PE-LD, bands PP or steel.
Disposal	The drive contains raw materials that should be recycled to preserve energy and natural resources. The package materials are environmentally compatible and recyclable. All metal parts can be recycled. The plastic parts can either be recycled or burned under controlled circumstances, according to local regulations. Most recyclable parts are marked with recycling marks. If recycling is not feasible, all parts excluding electrolytic capacitors and printed circuit boards can be landfilled. The DC capacitors (C1-1 to C1-x) contain electrolyte and the printed circuit boards contain lead, both of which are classified as hazardous waste within the EU. They must be removed and handled according to local regulations. For further information on environmental aspects and more detailed recycling instructions, please contact your local ABB distributor.

Auxiliary power consumptions

Circuit boards

Type	U_n V DC	U_n V AC	f Hz	I_n A	I_{max} A
AGPS-11C	–	230	50	0.1	–
	–	115	60	0.2	–
AGPS-21C	–	230	50	0.3	–
		115	60	0.6	–
APBU-44	24	–	–	0.2	–
ASFC-01C	–	230	50	0.04	–
	–	115	60	0.08	–
NPBU-42	24	–	–	0.2	0.235
RDCU-02	24	–	–	0.25	1.2

Cooling fans

Frame size	Type	U_n V AC	f Hz	I_n A	I_{start} A
R7i	R2E225-BD92-12	230	50	0.7	1.4
			60	0.7	1.4
	R2E225-BD40-21	115	60	1.8	3.6
R8i	D2D160-BE02-11	400	50	1.3	2.6
		320	60	1.9	3.8

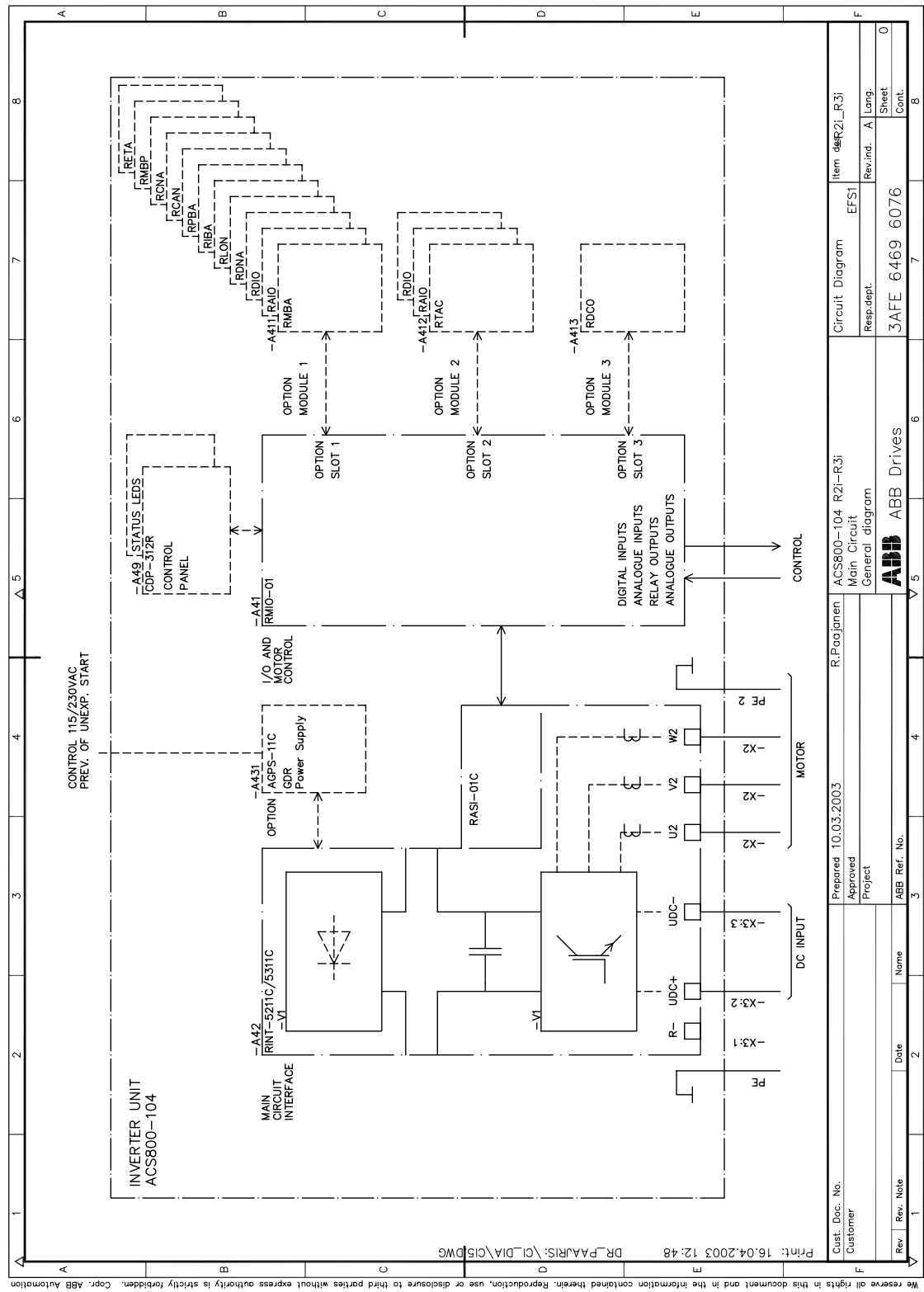
Circuit diagrams

What this chapter contains

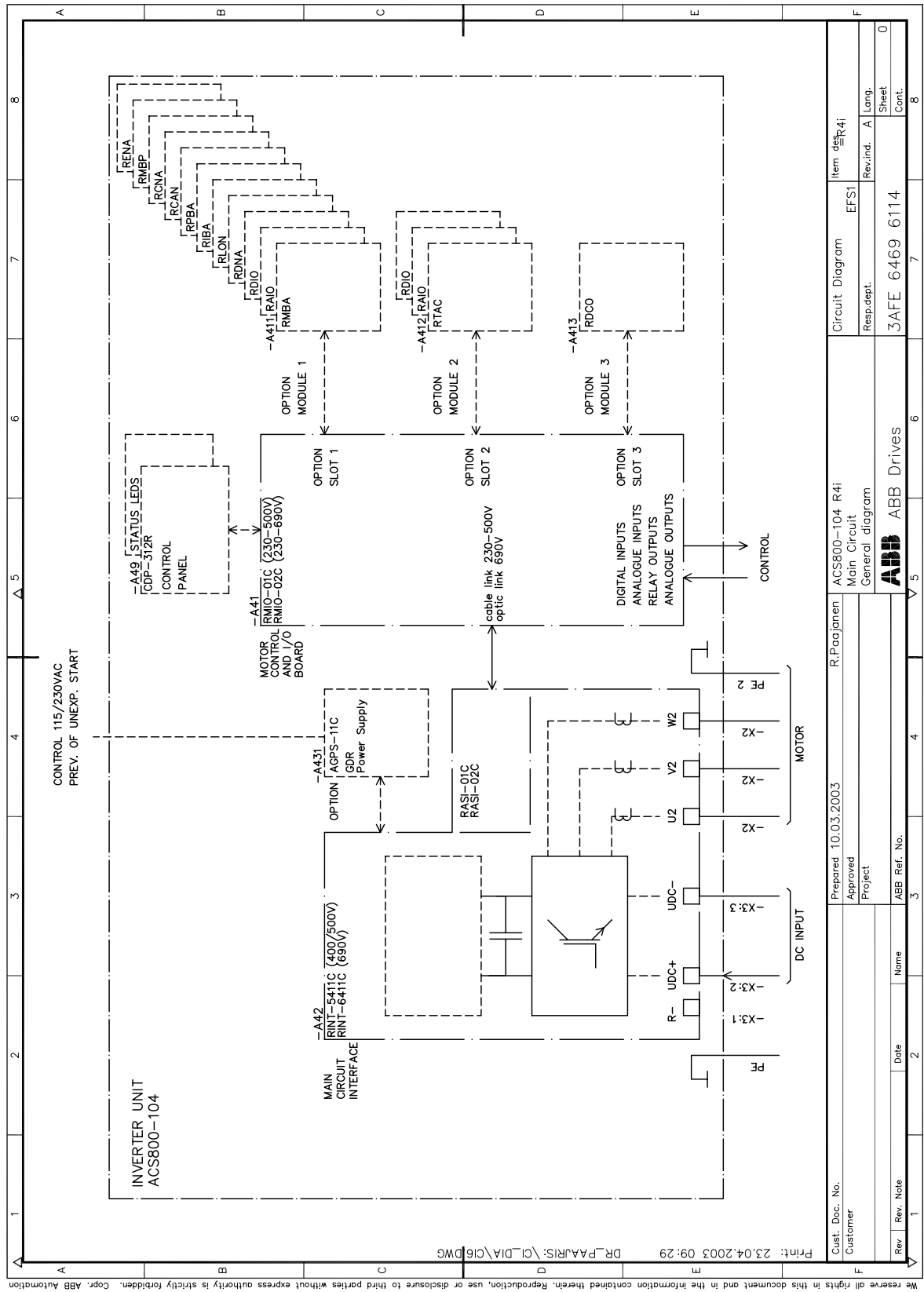
This chapter contains the block diagrams of the ACS800-104 inverter modules, as well as example connection diagrams for the whole inverter unit.

Frame R2i to R5i

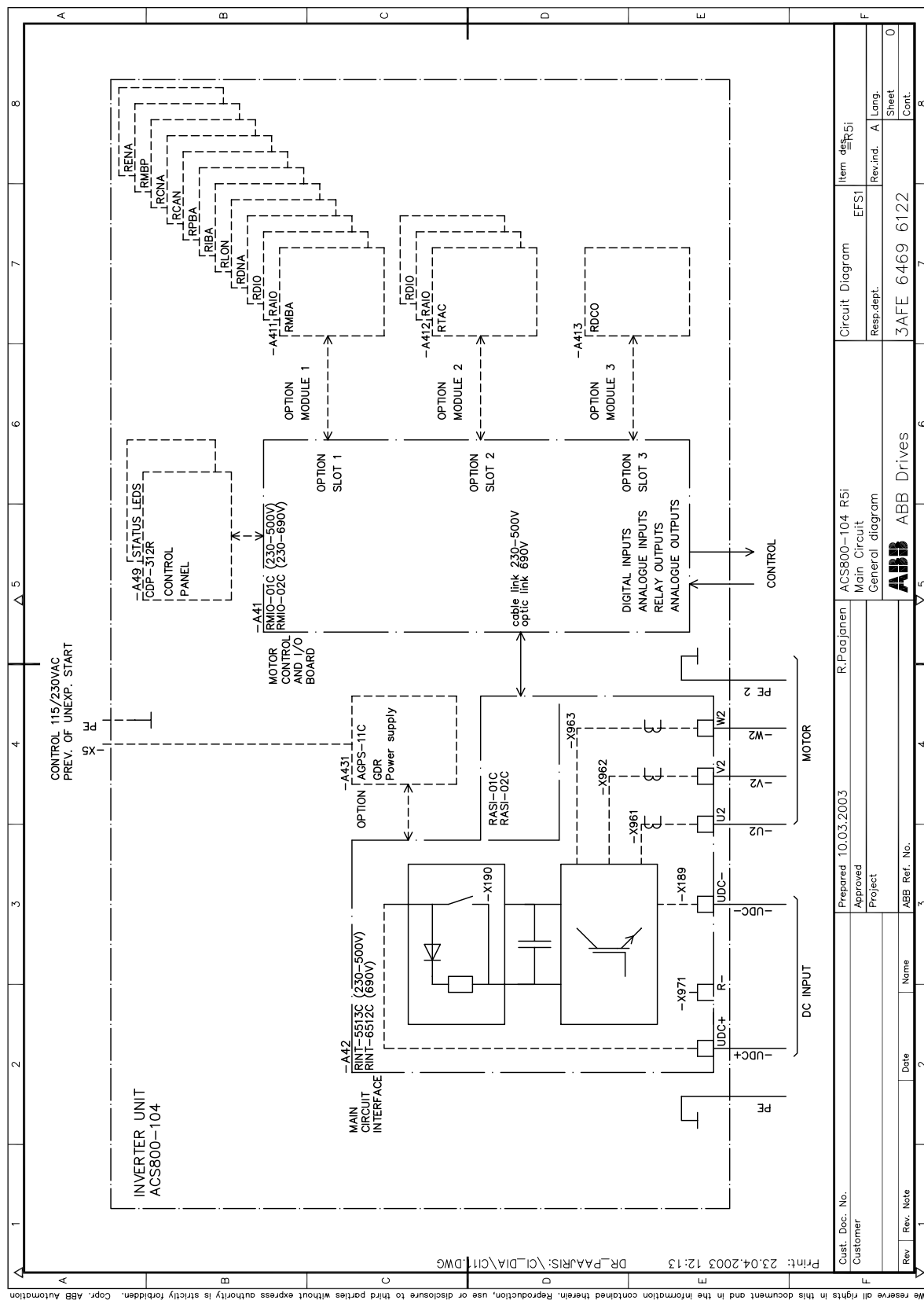
R2i/R3i – Block diagram



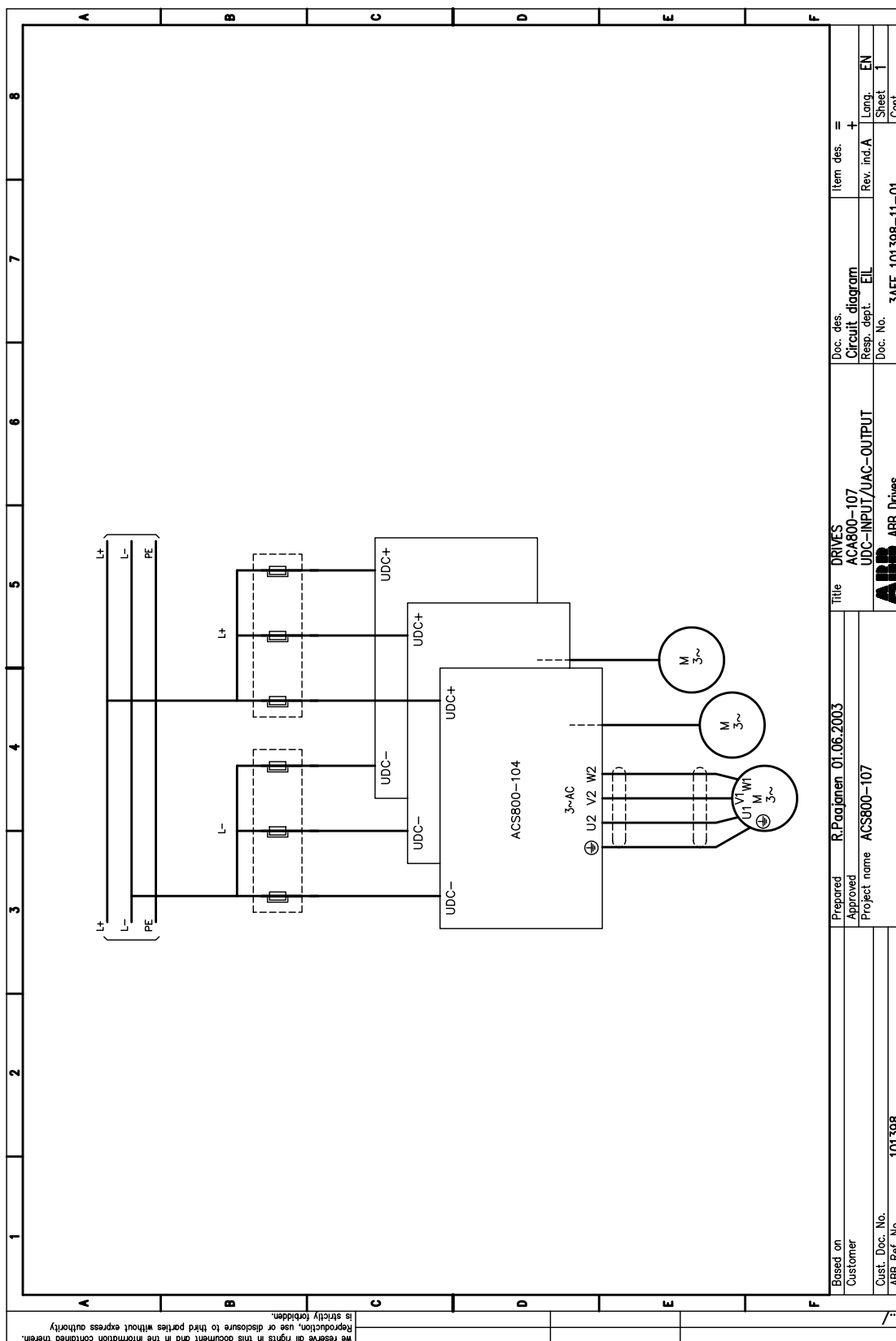
R4i – Block diagram



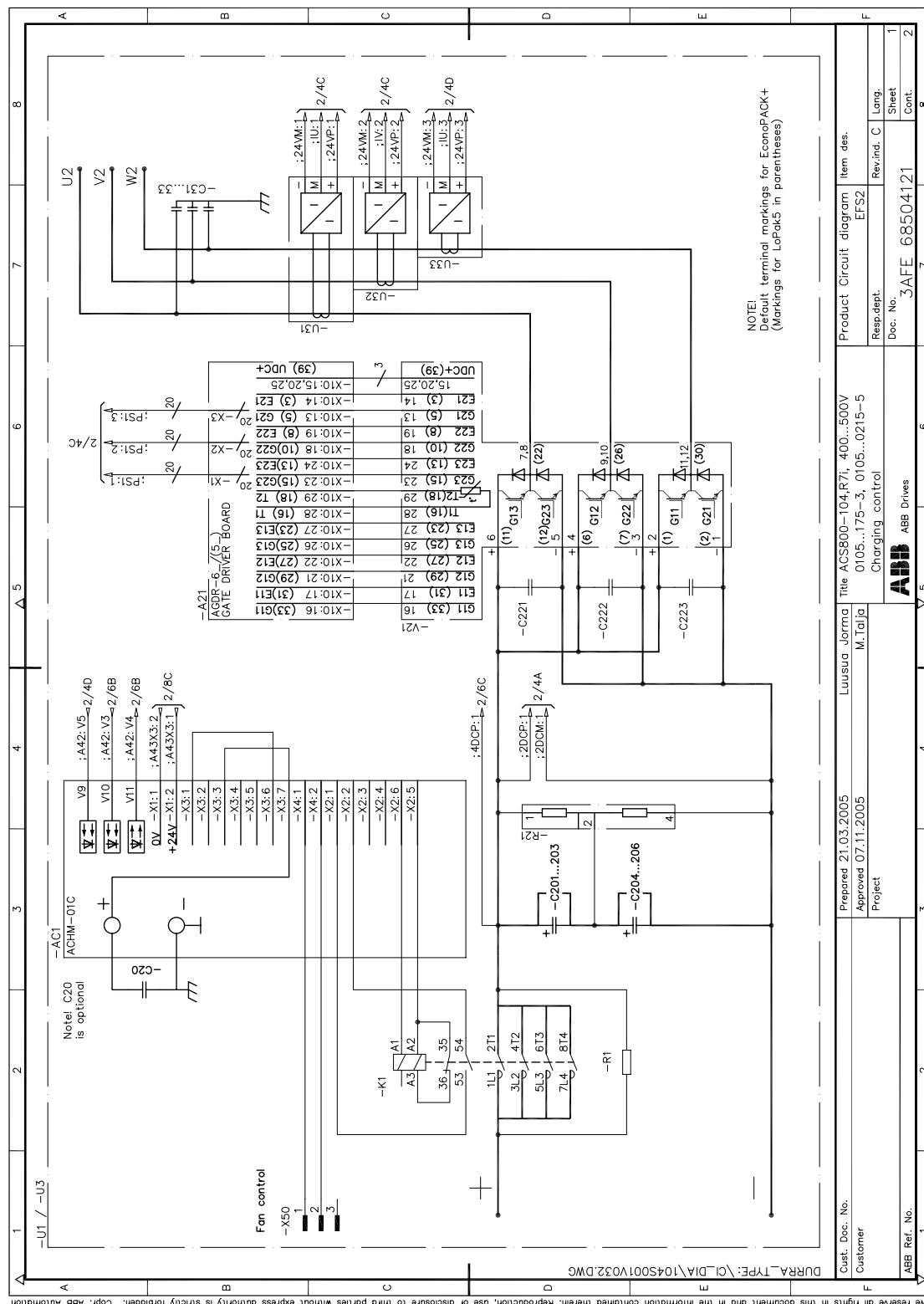
R5i – Block diagram

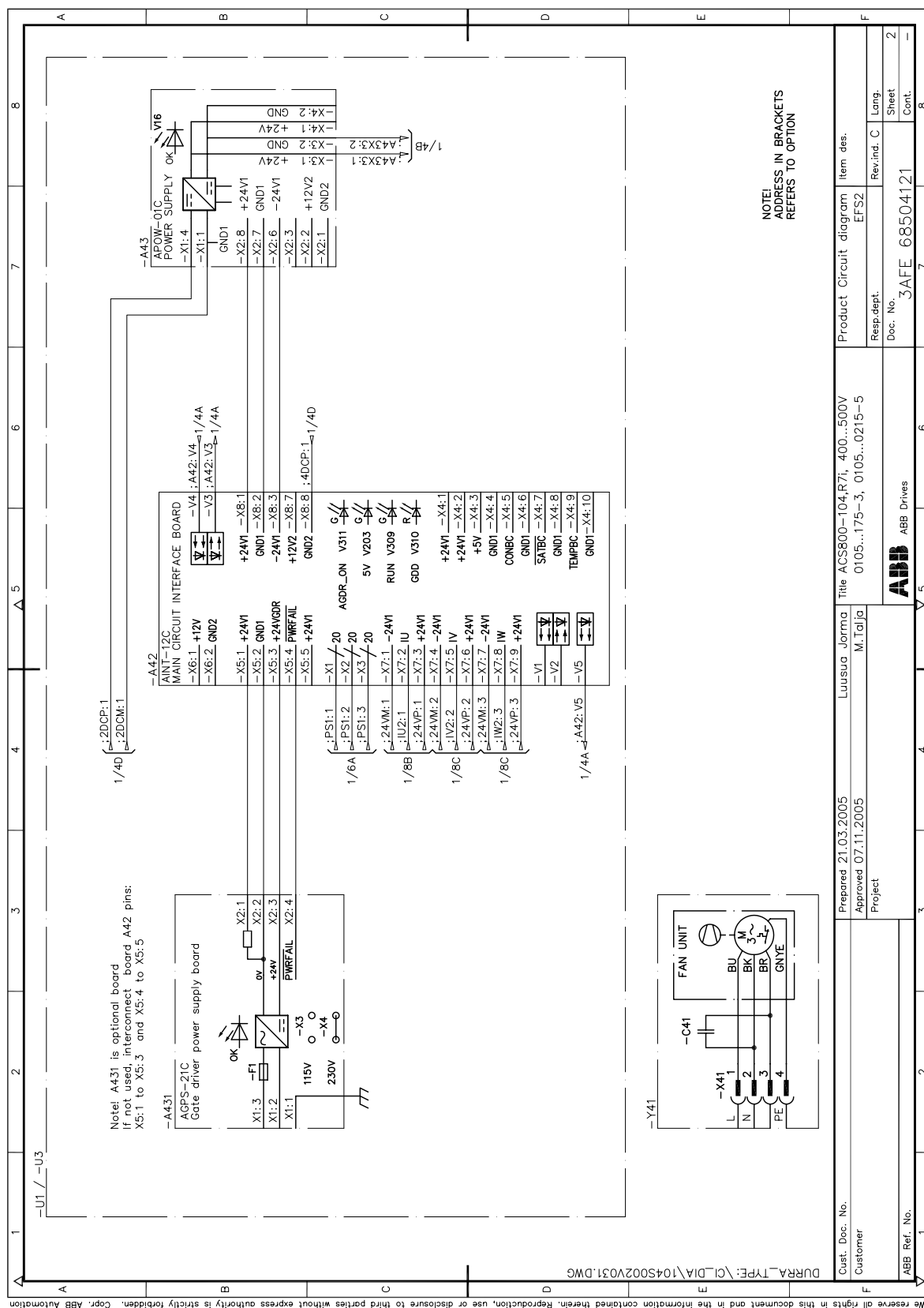


Circuit diagrams

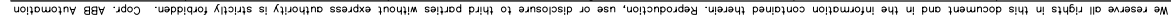


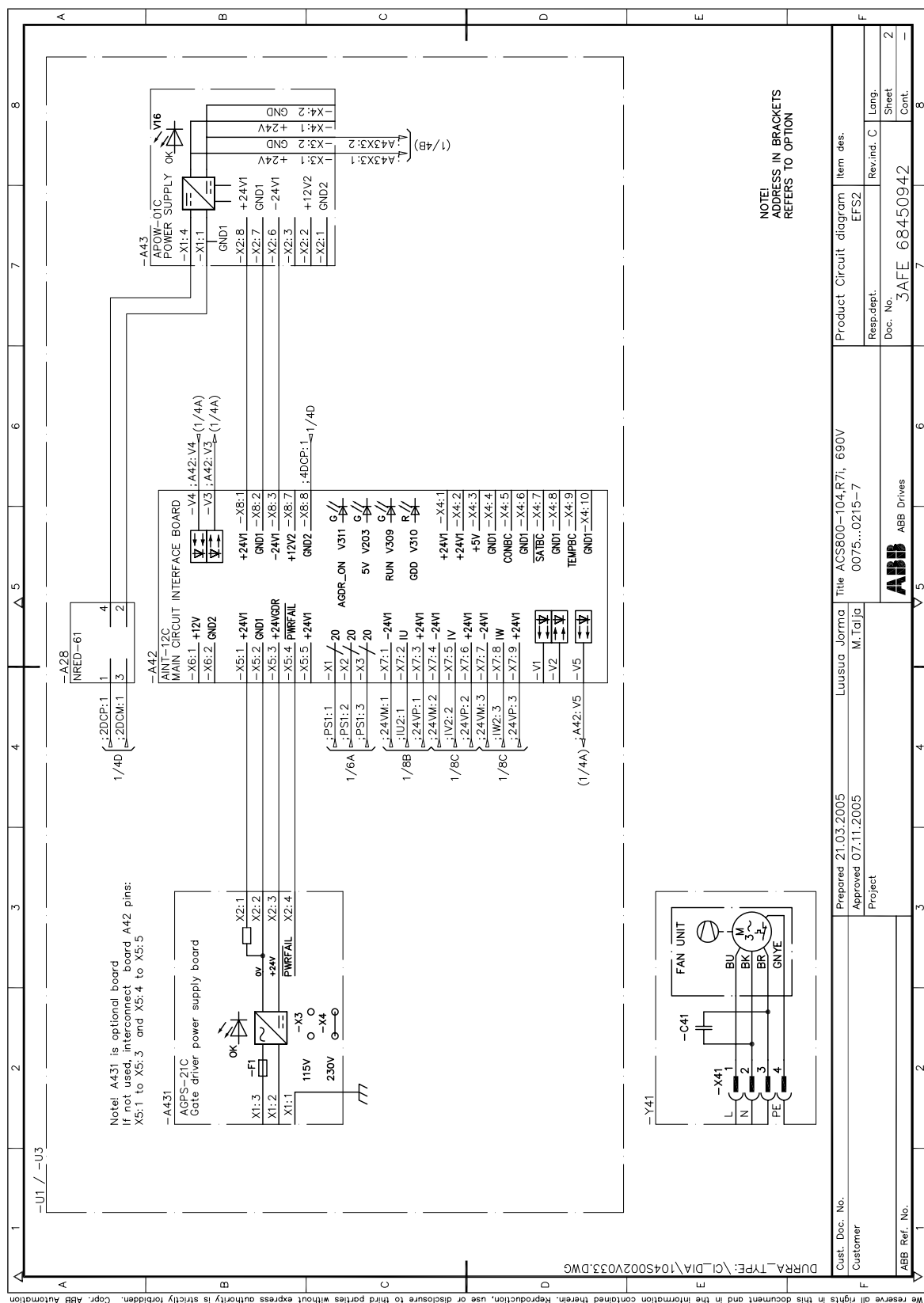
Connection diagram (400/500 V)





Circuit diagrams

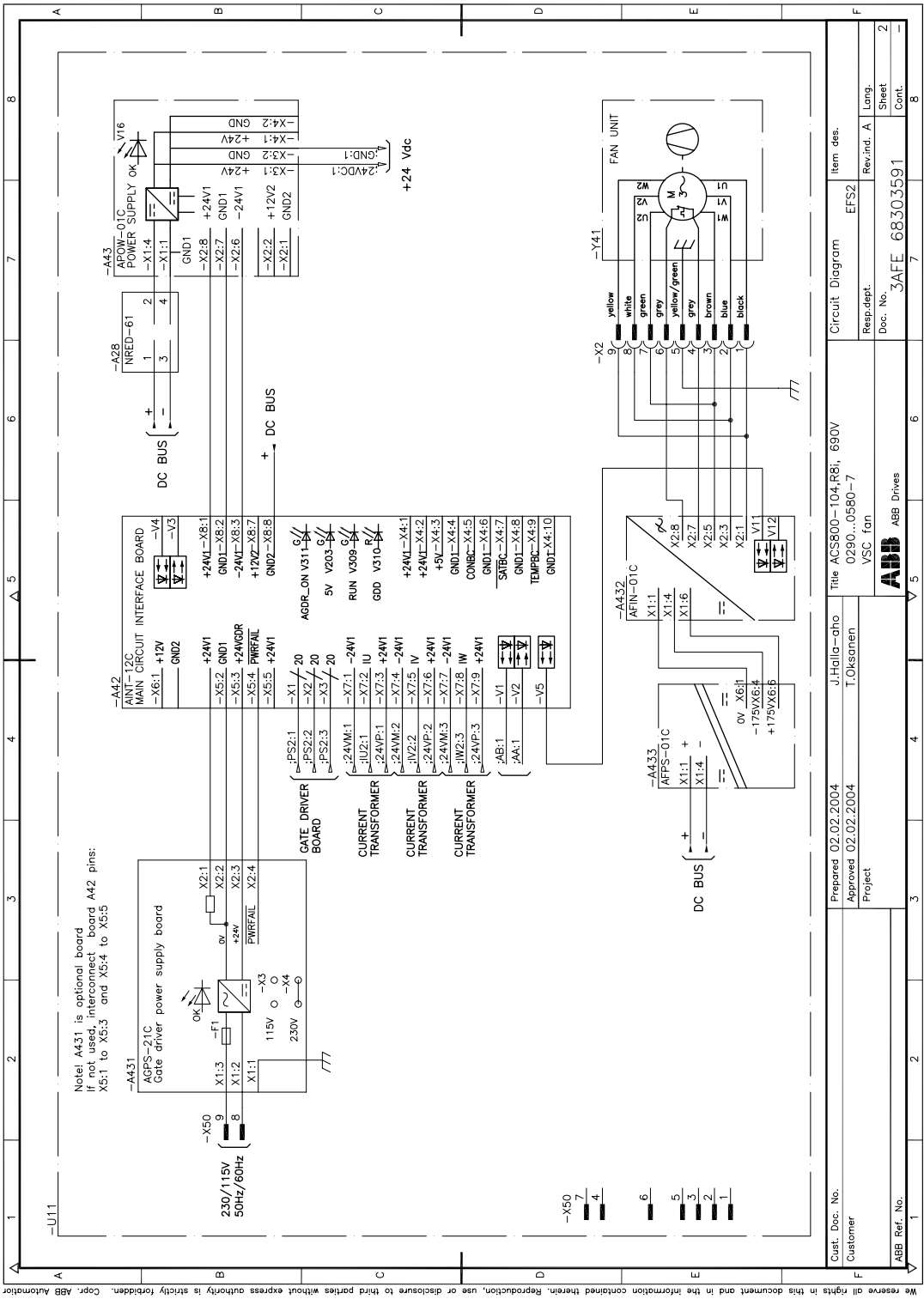




Frame R8i and multiples

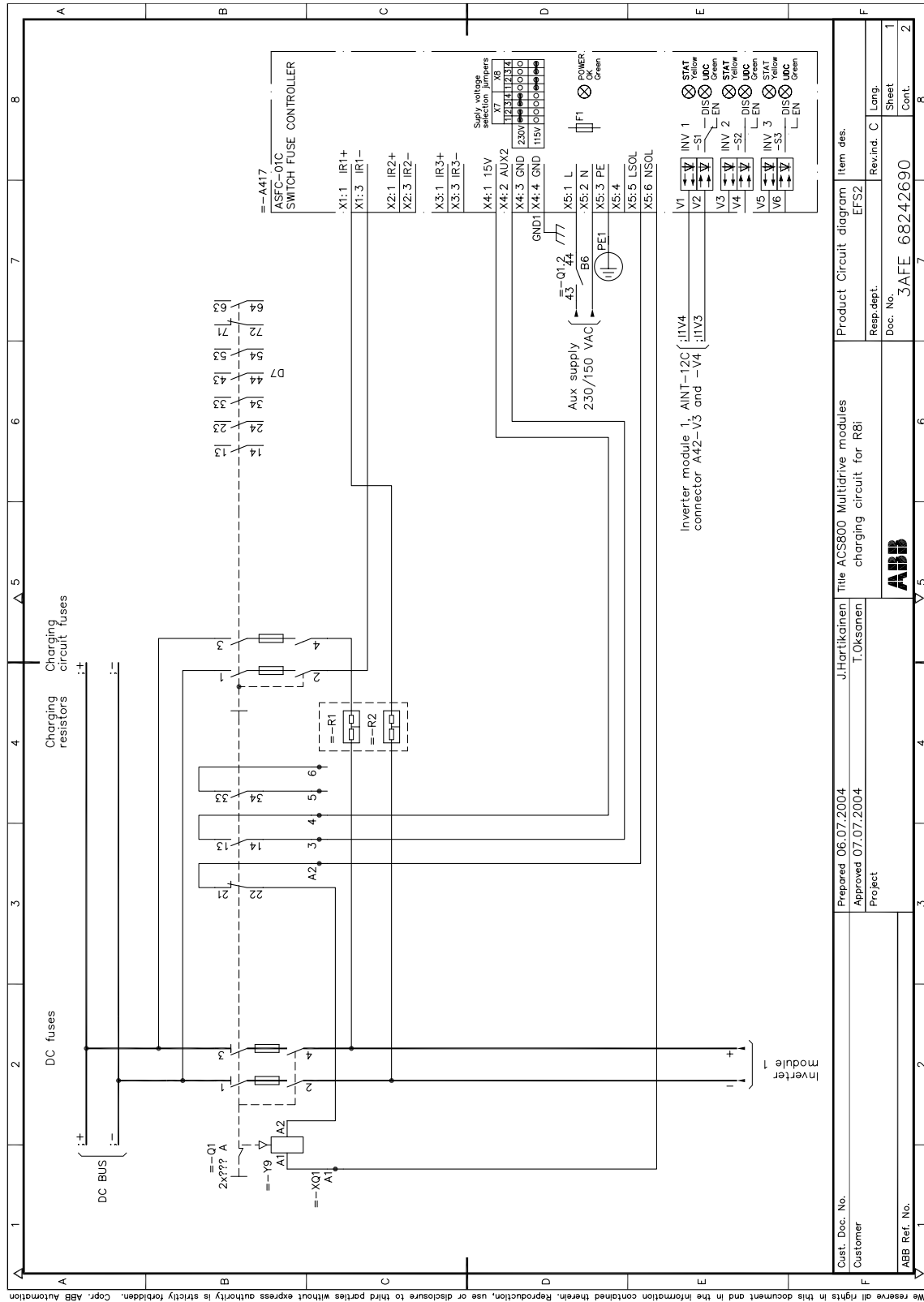
R8i – Internal diagram

The diagram depicts an R8i module with optional speed-controlled fan.

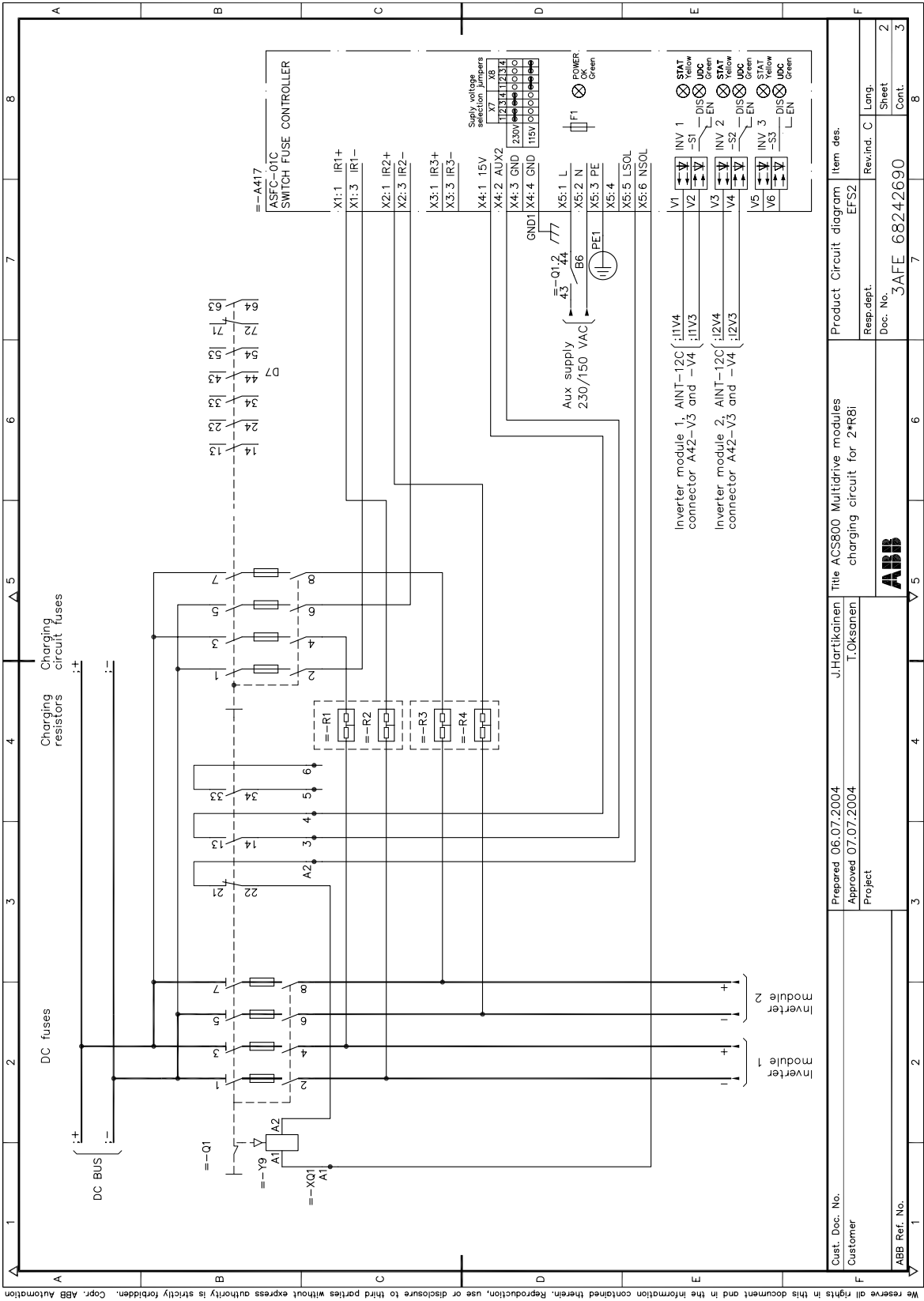


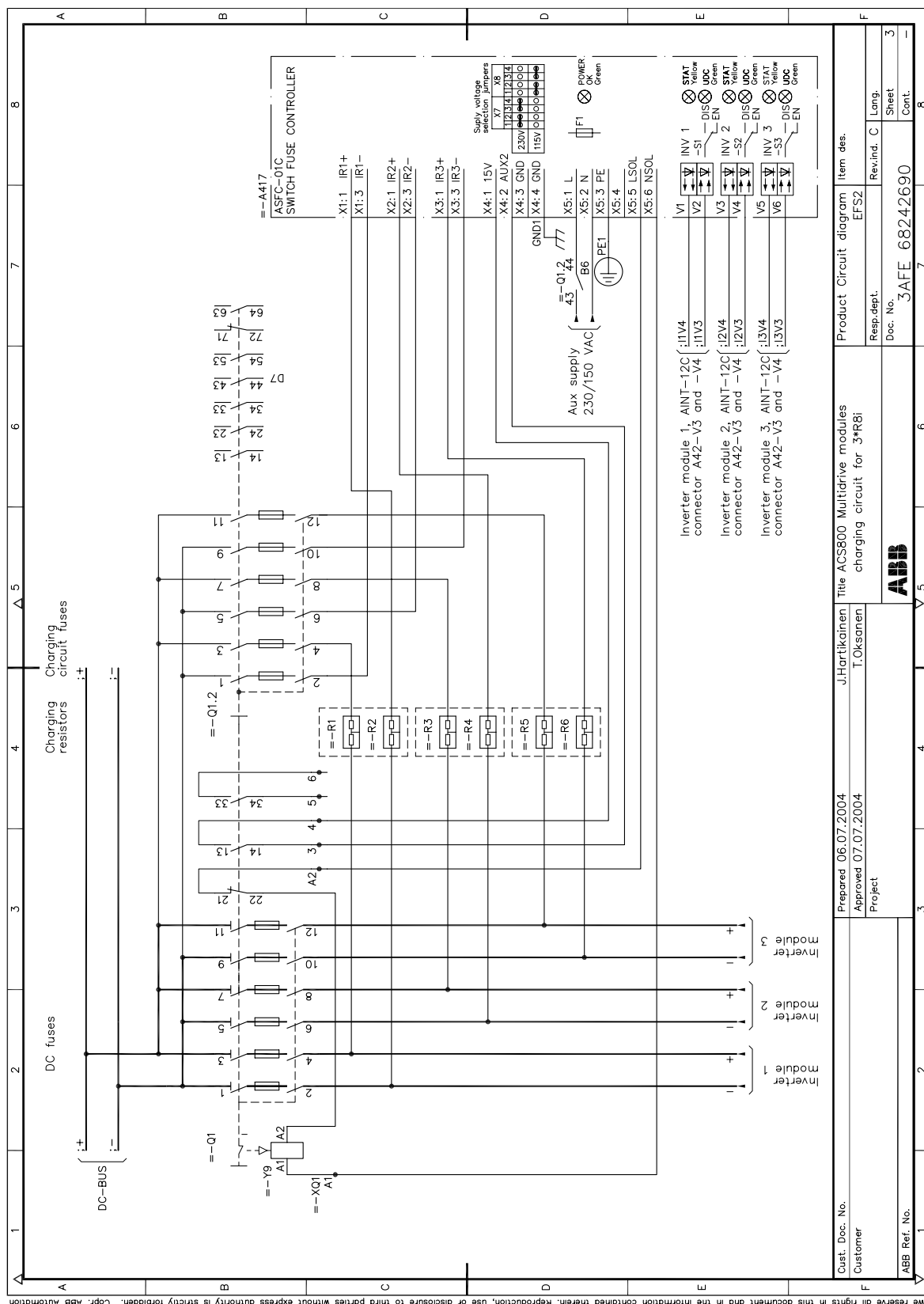
Charging circuit

R8i

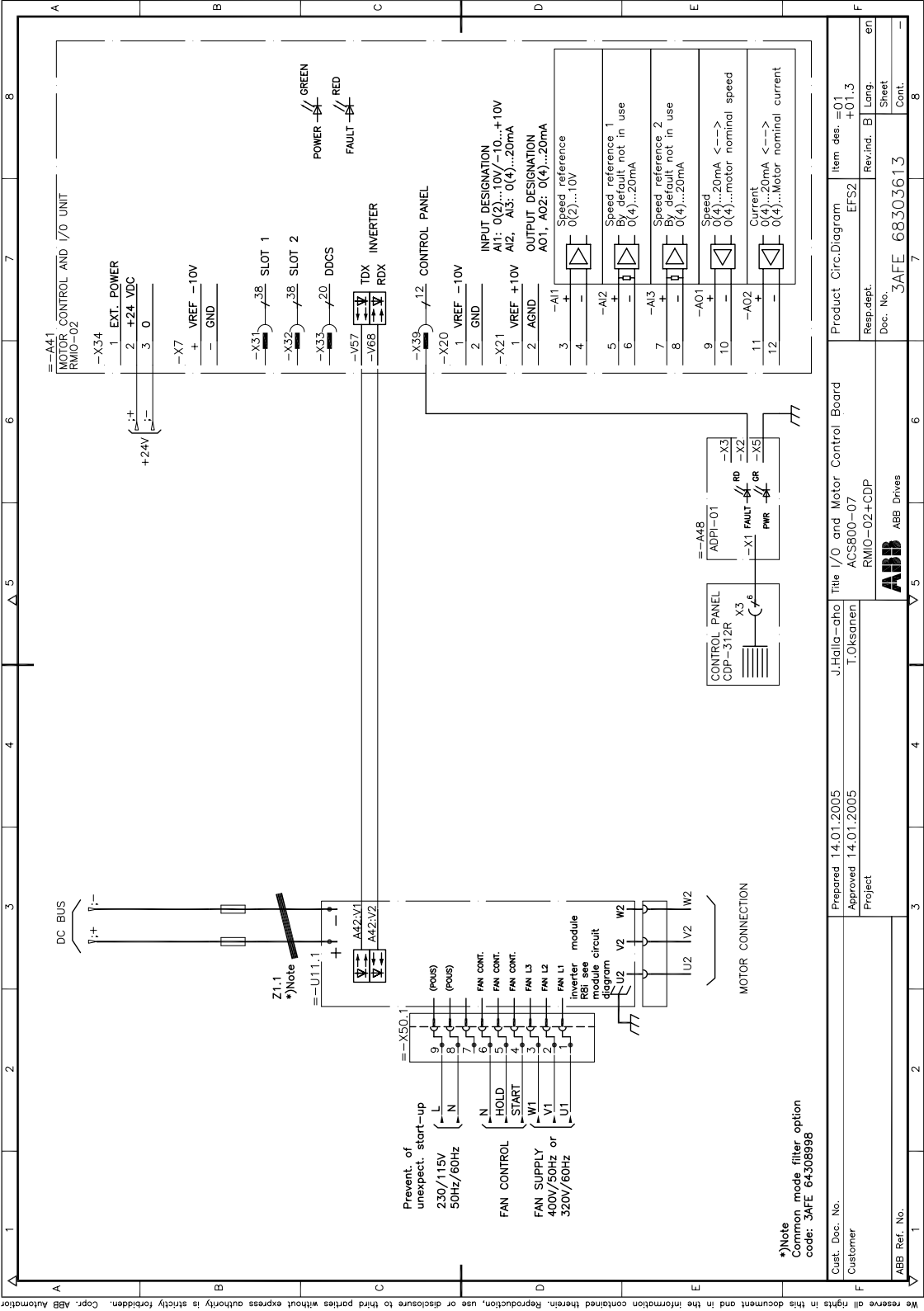


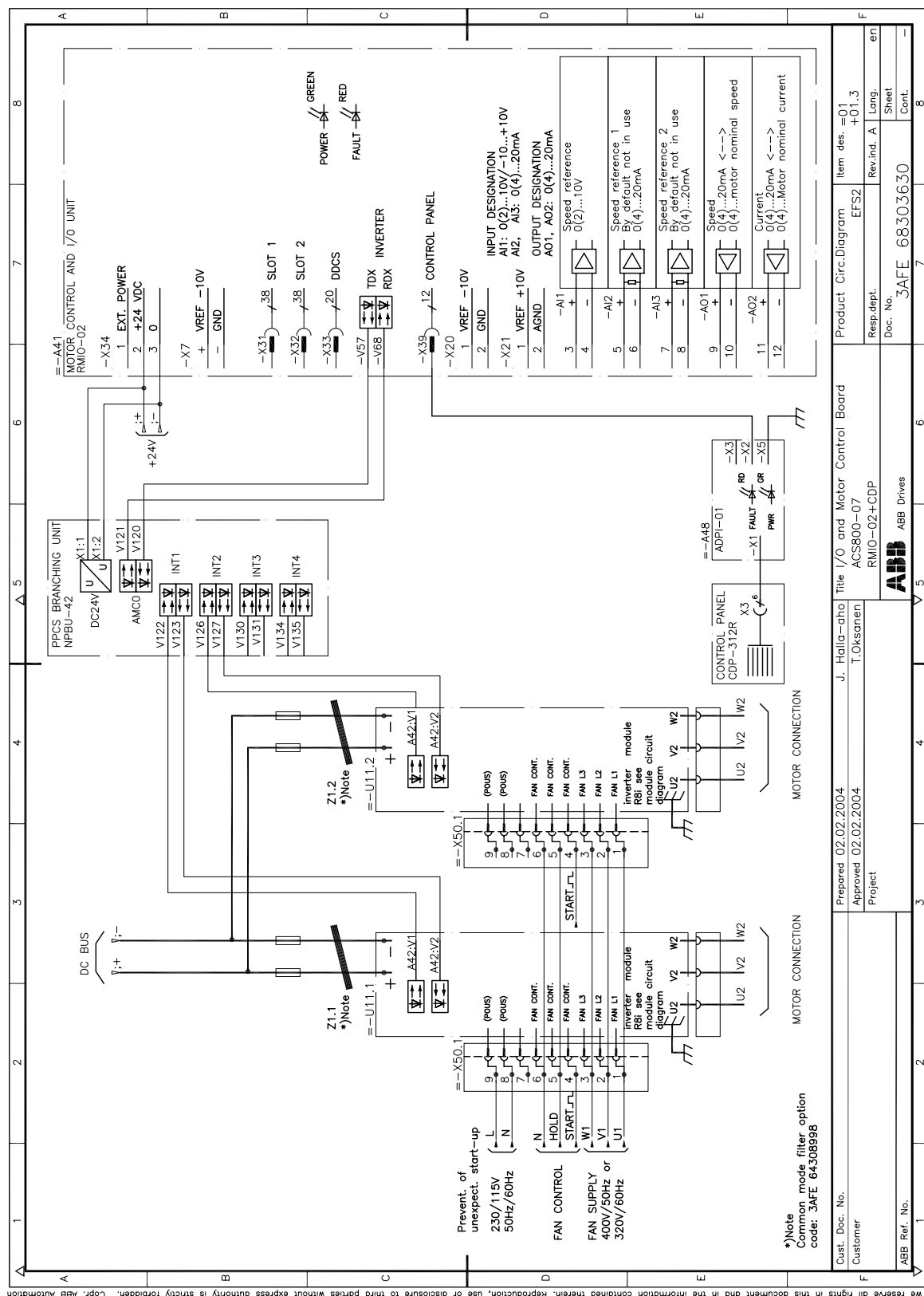
2xR8i



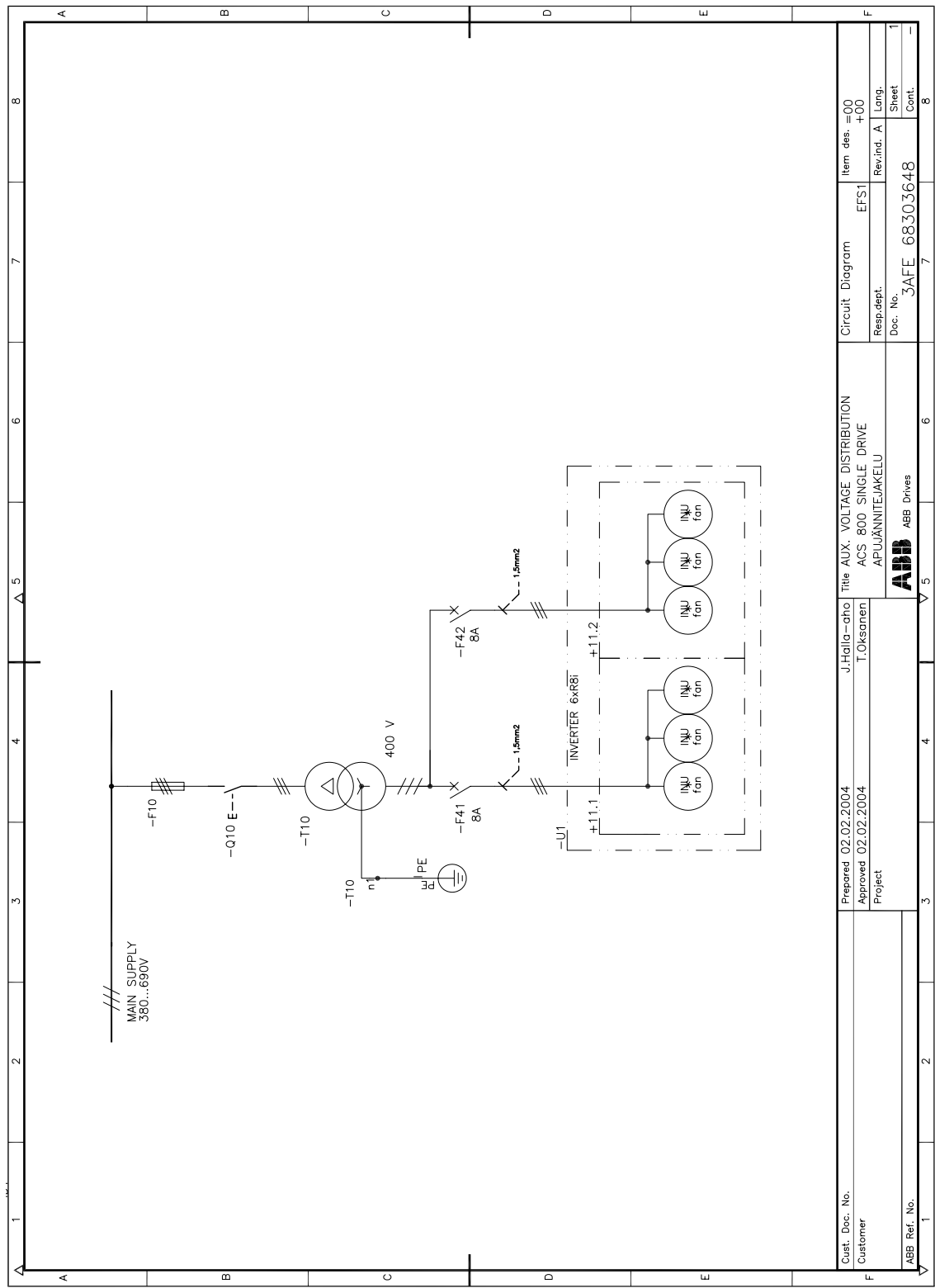
$3 \times R8i$ 

I/O and control
R8i

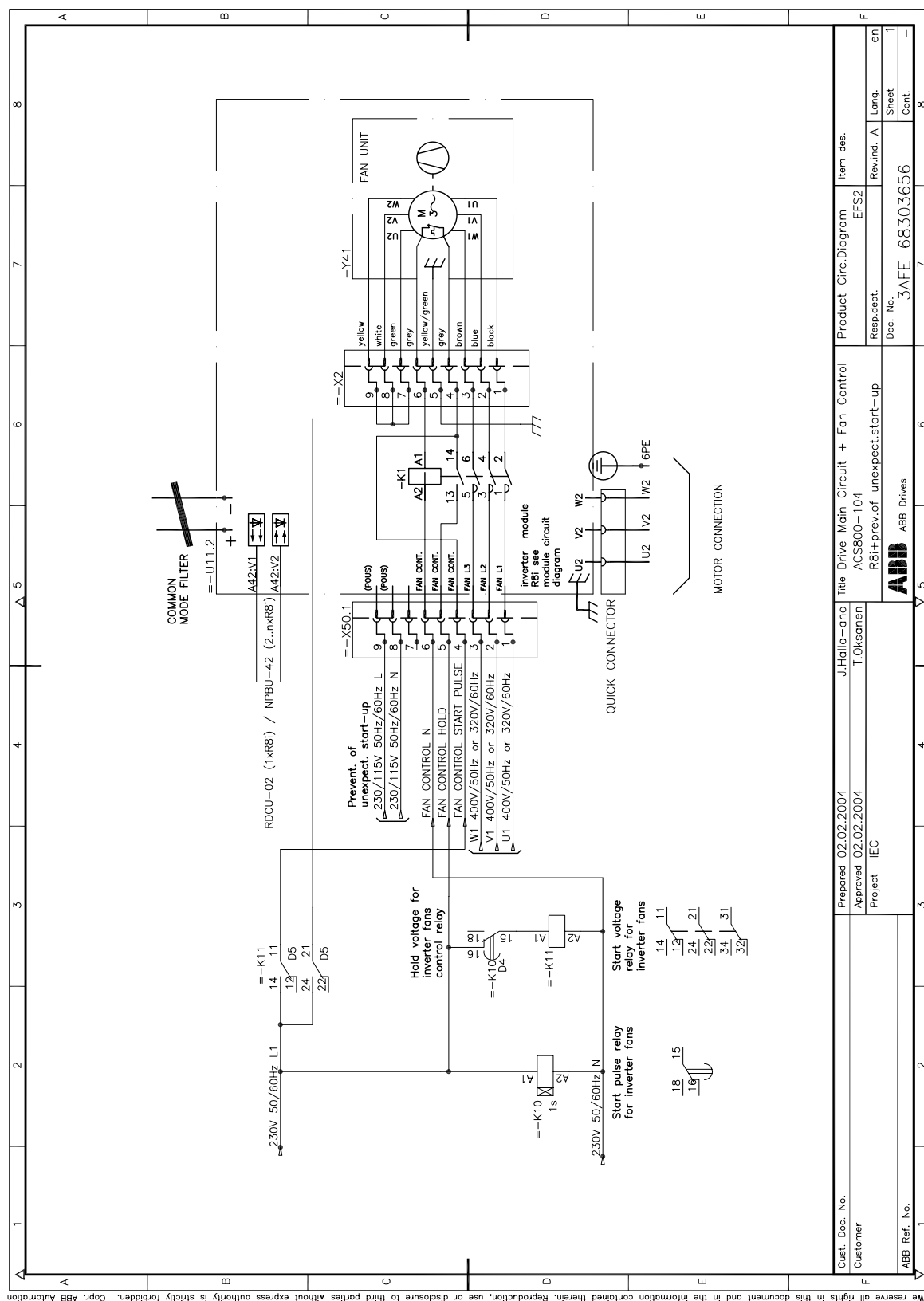


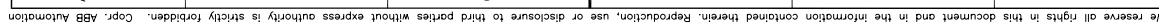
$2 \times R8i$ 

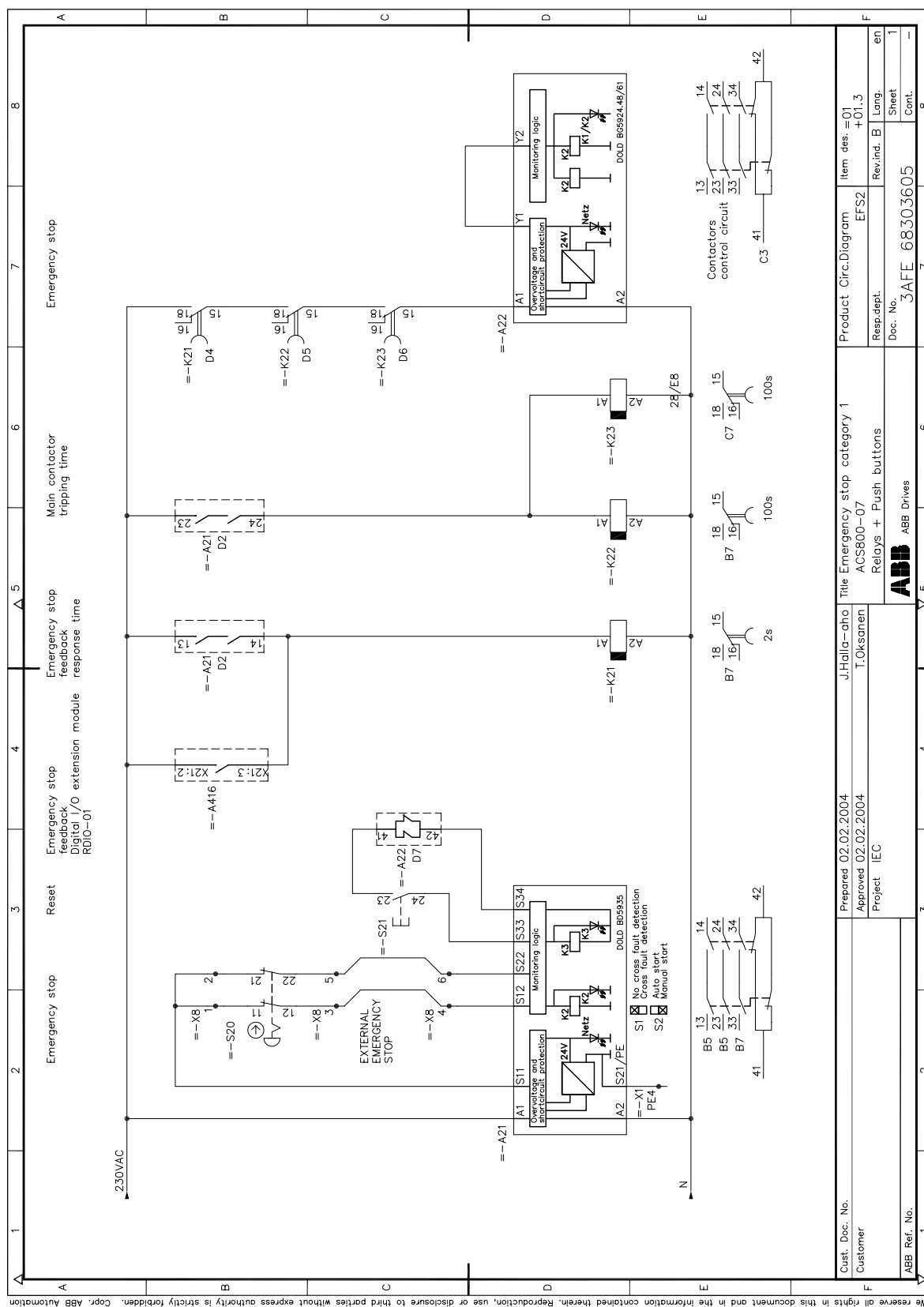
Cooling fan control (inverter modules without optional speed-controlled fan)
Auxiliary voltage distribution



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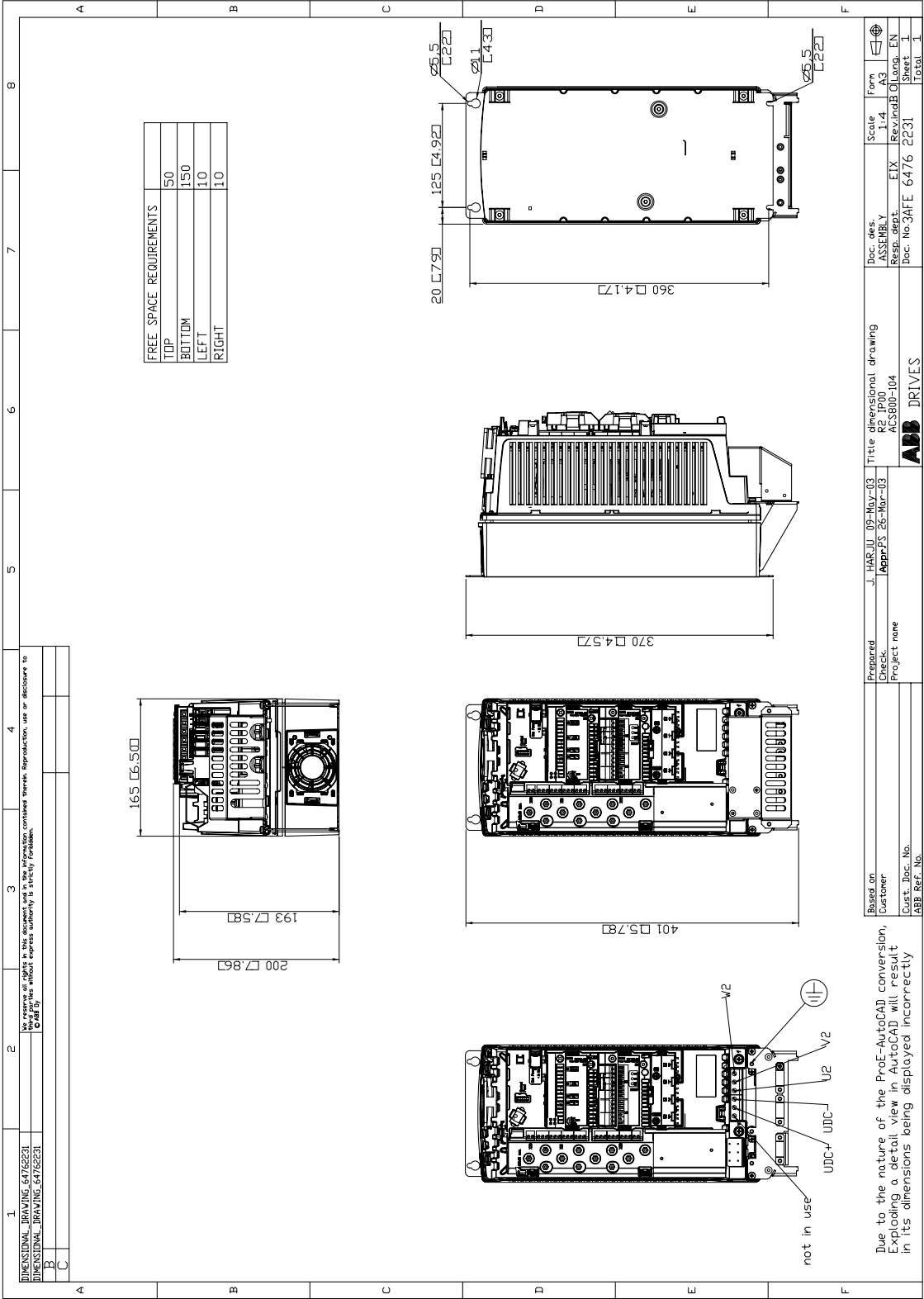
Dimension drawings

What this chapter contains

This chapter contains dimension drawings of the ACS800-104 inverter modules as well as auxiliary components. Dimensional drawings of most mounting accessories are available from ABB by request.

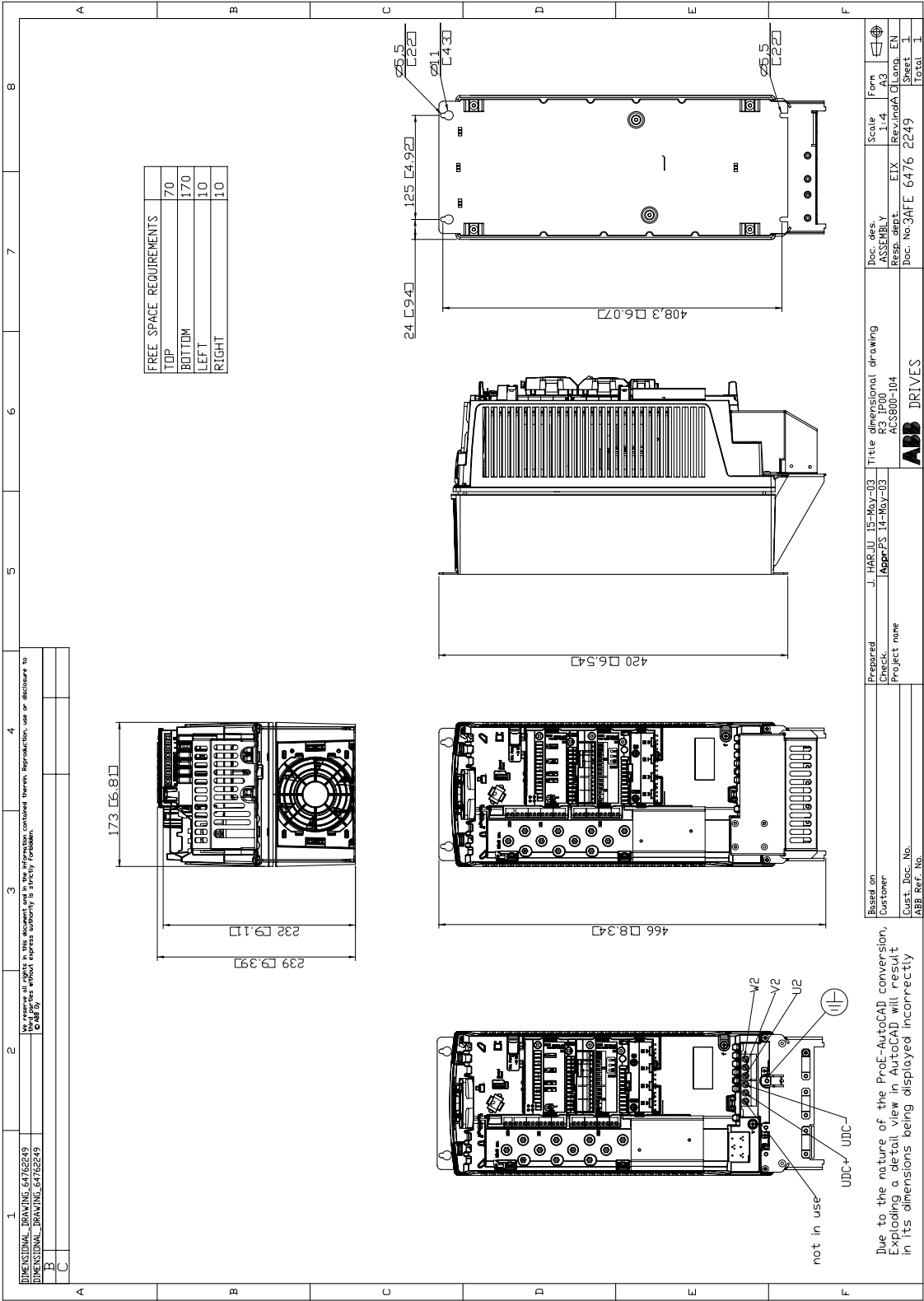
Frame R2i

Module dimensions



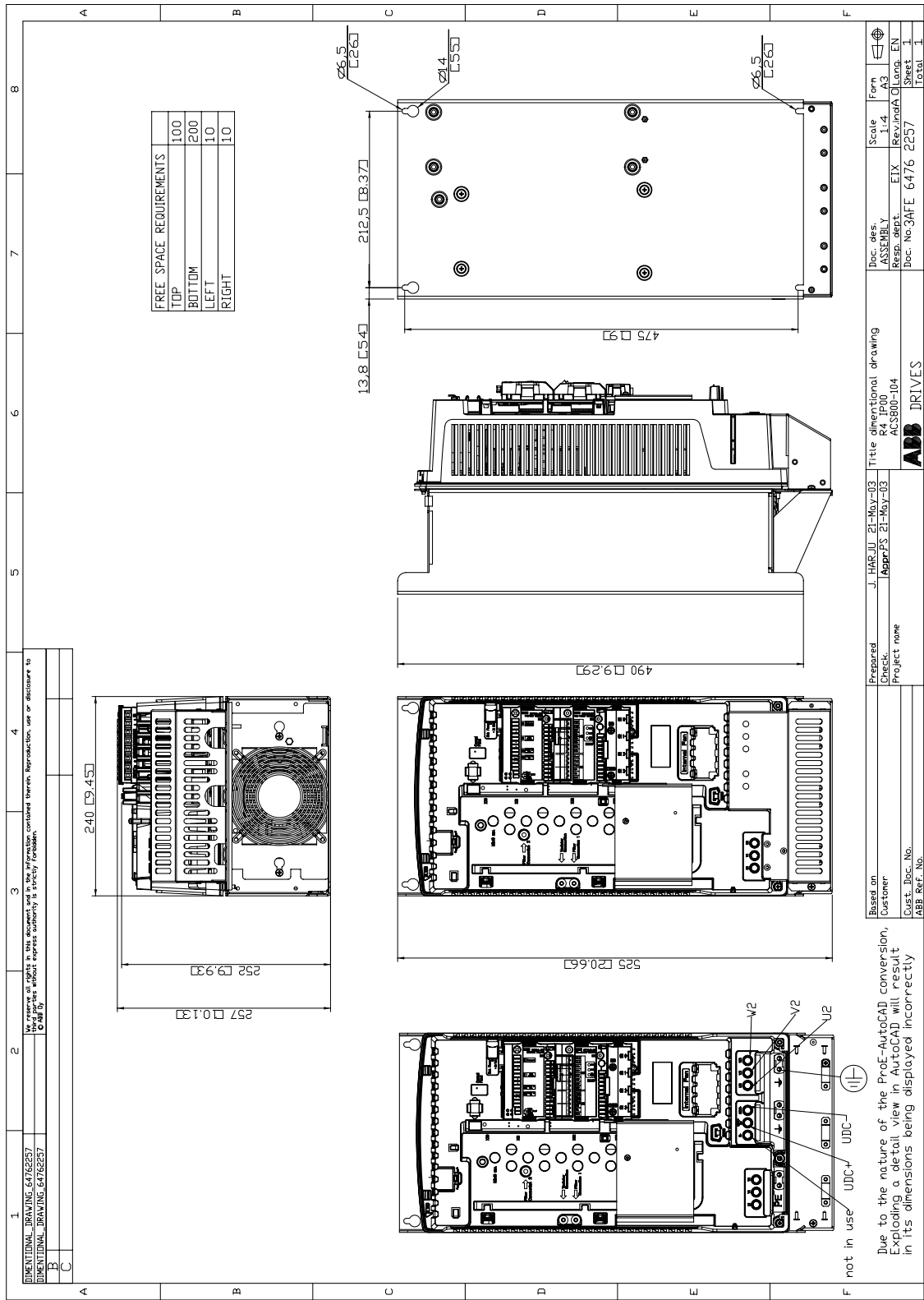
Frame R3i

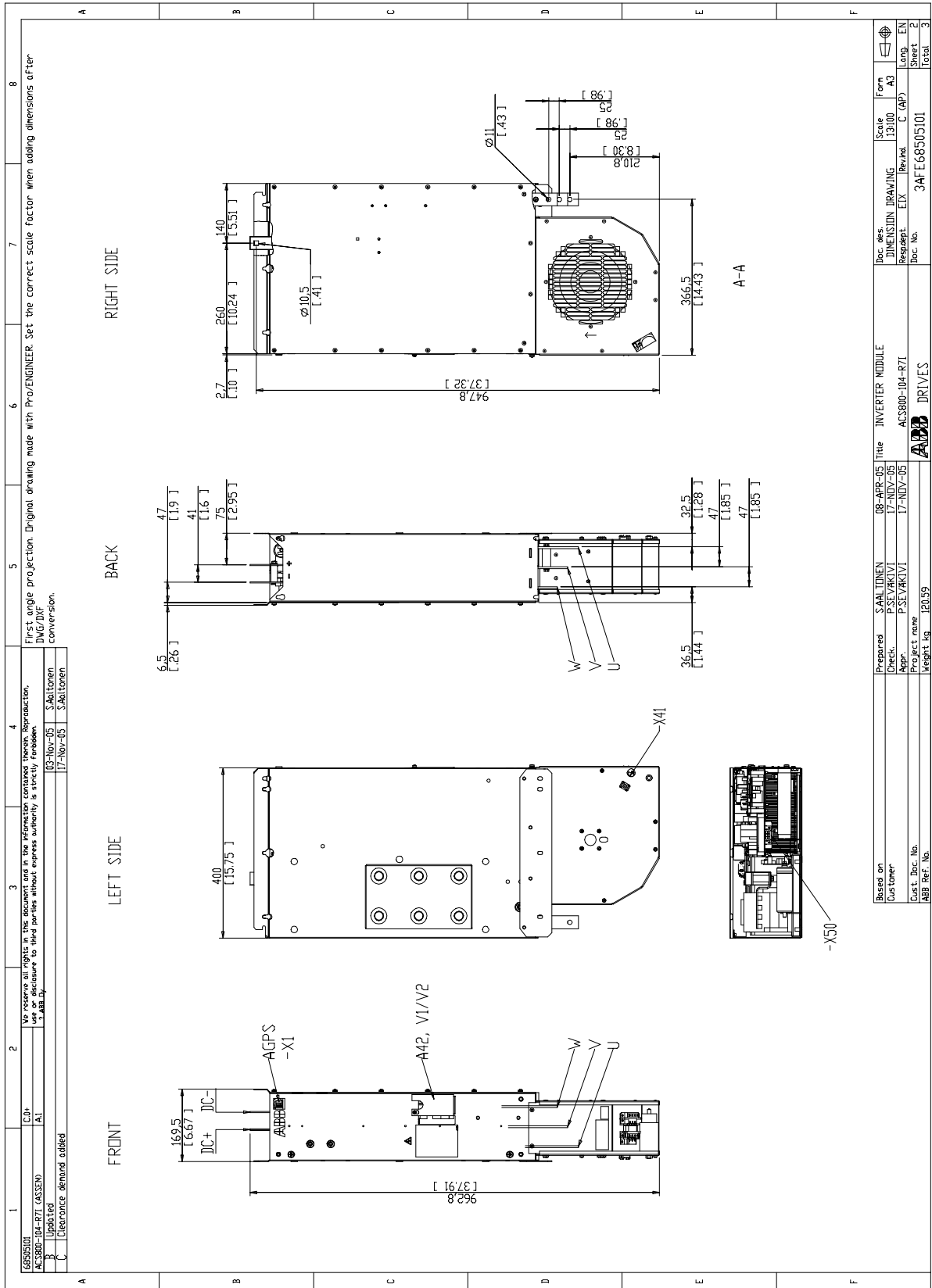
Module dimensions

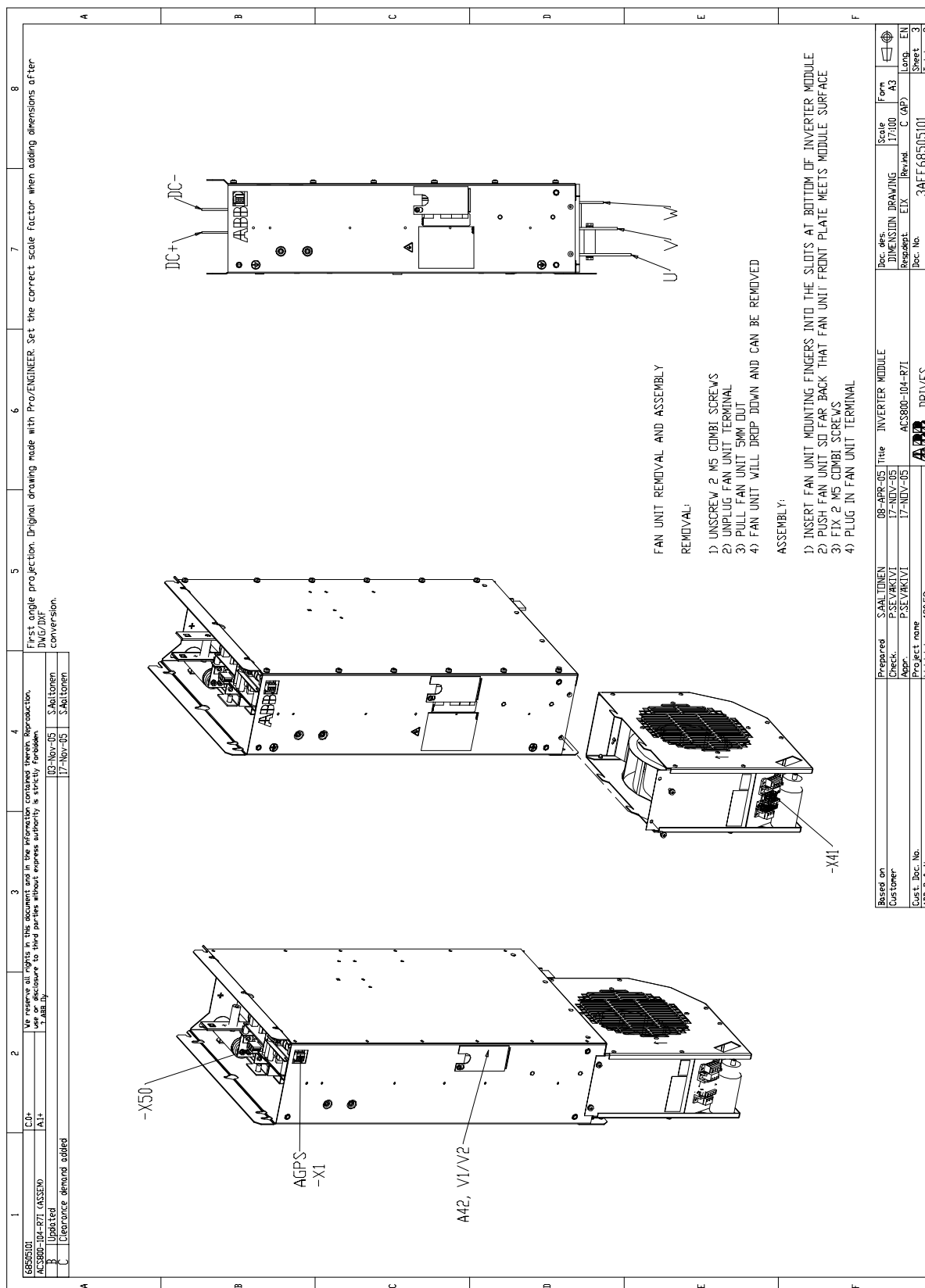


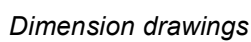
Frame R4i

Module dimensions



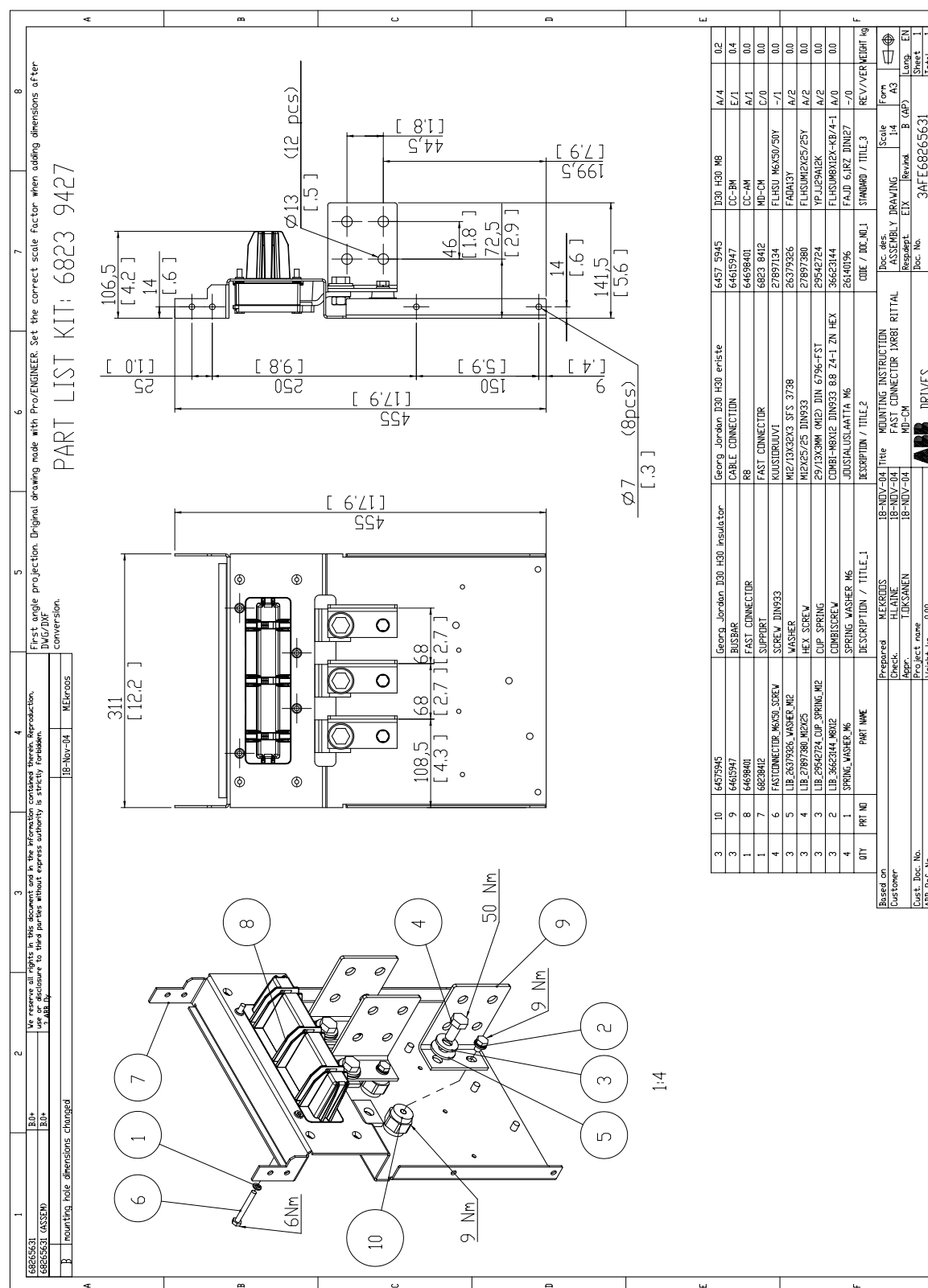




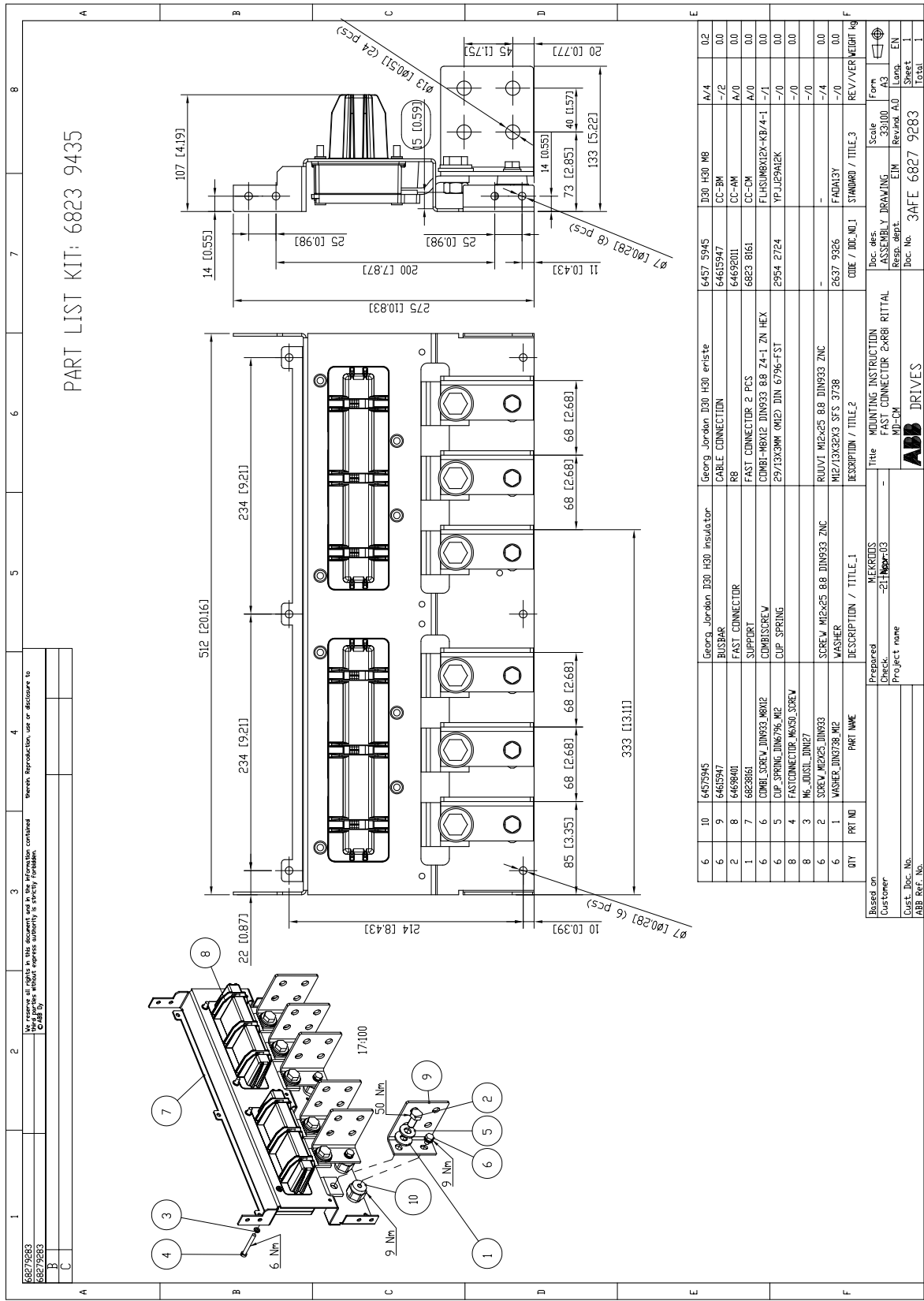


Quick connector chassis socket kits

Kit #68239427

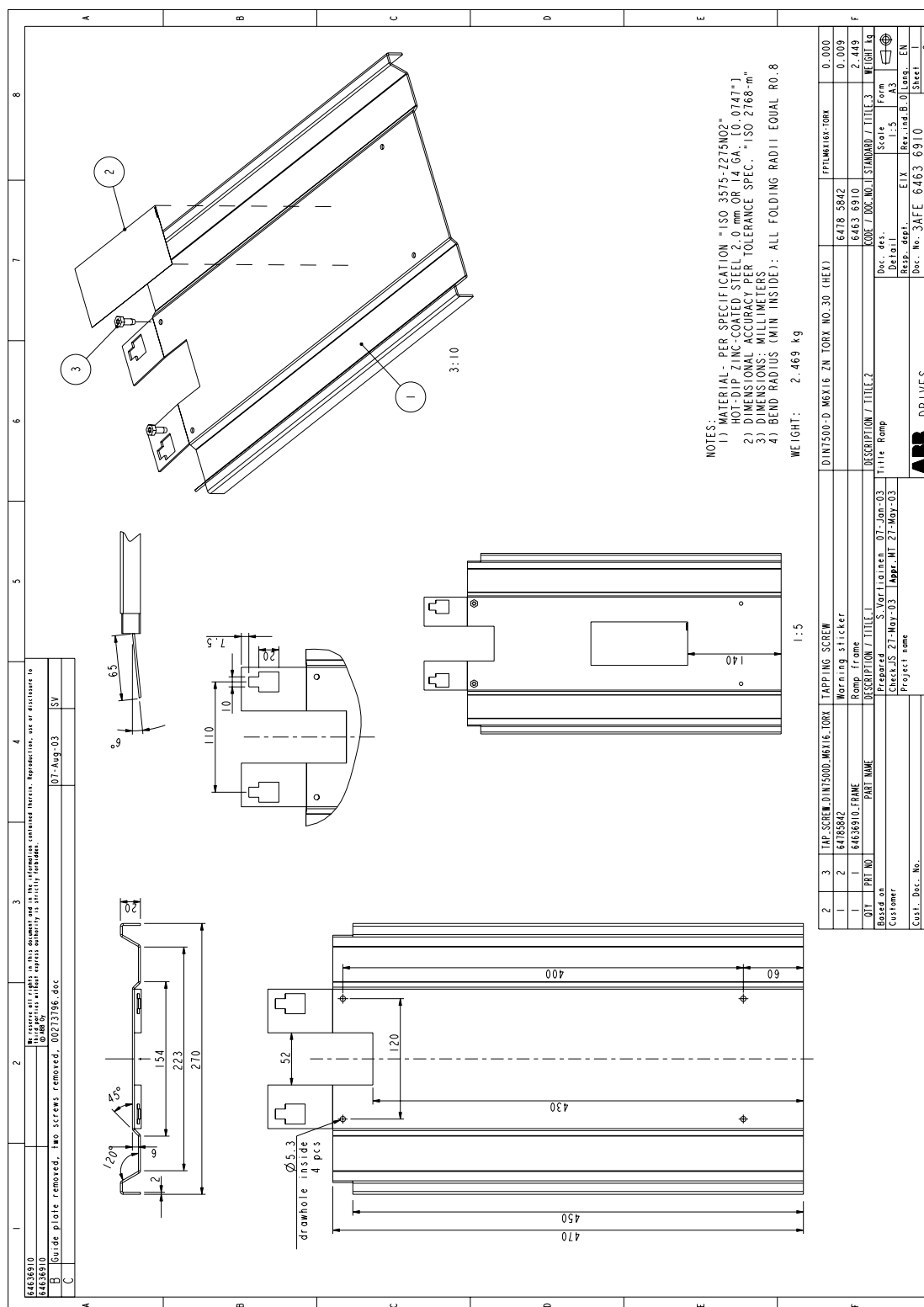


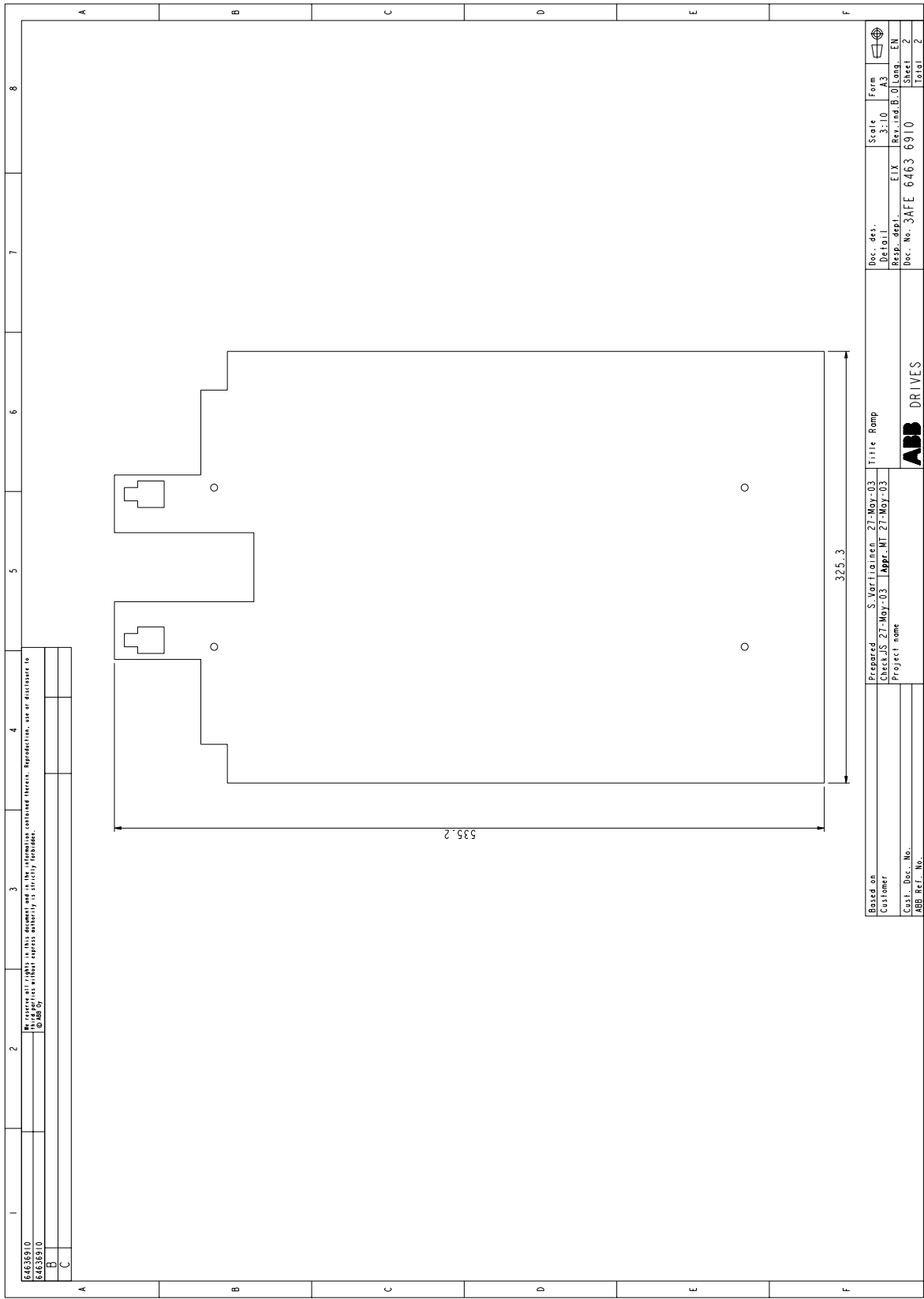
Kit #68239435



Module extraction/insertion ramp

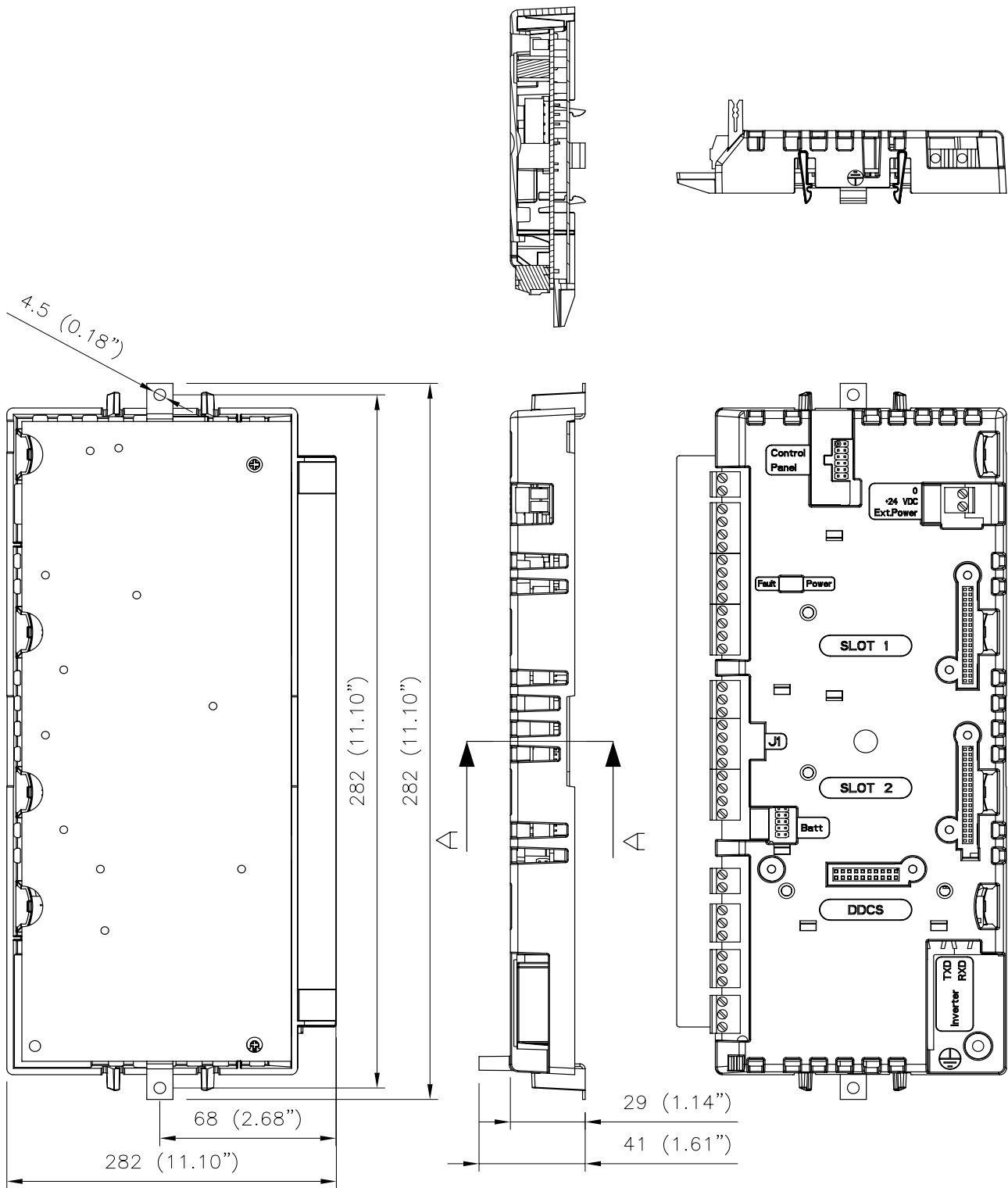
This example design of a module extraction/insertion ramp is for a lifting height of 50 mm, and should be redesigned for other heights.



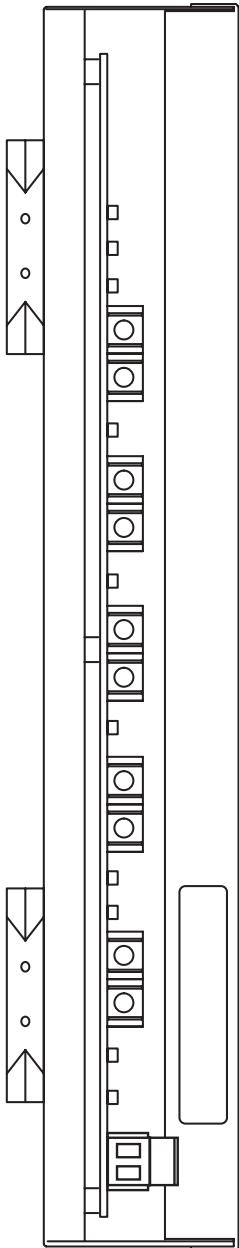
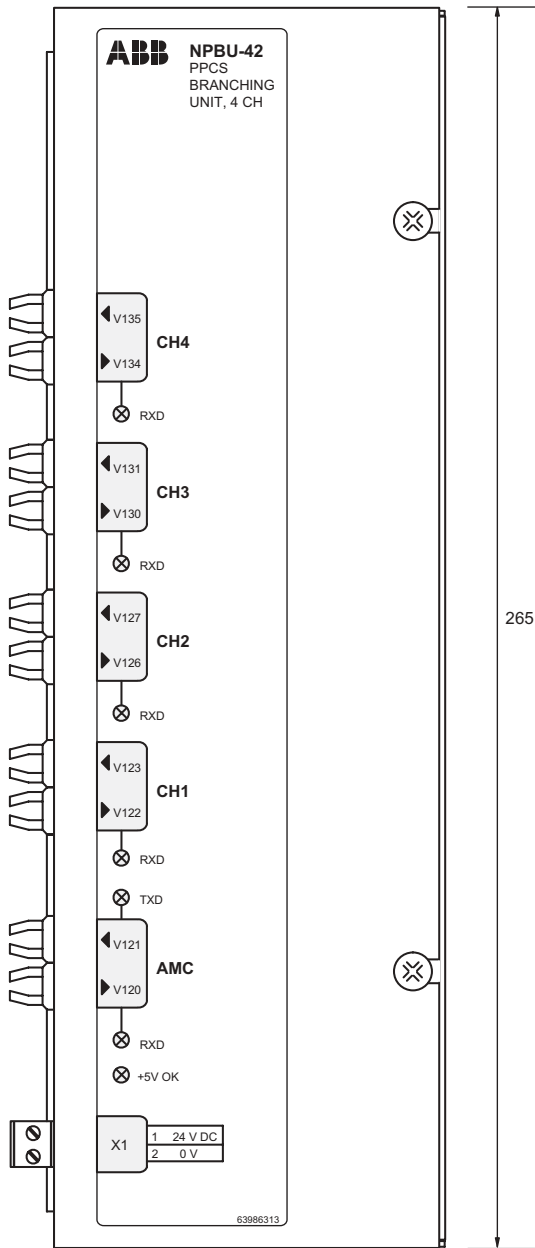
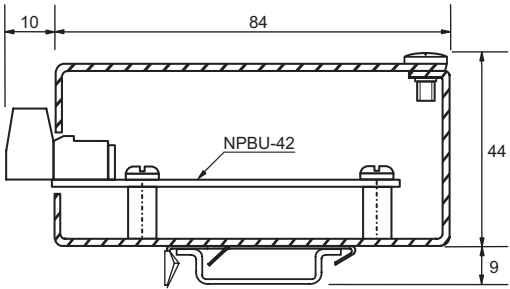


Control electronics

RDCU-02(C) control unit

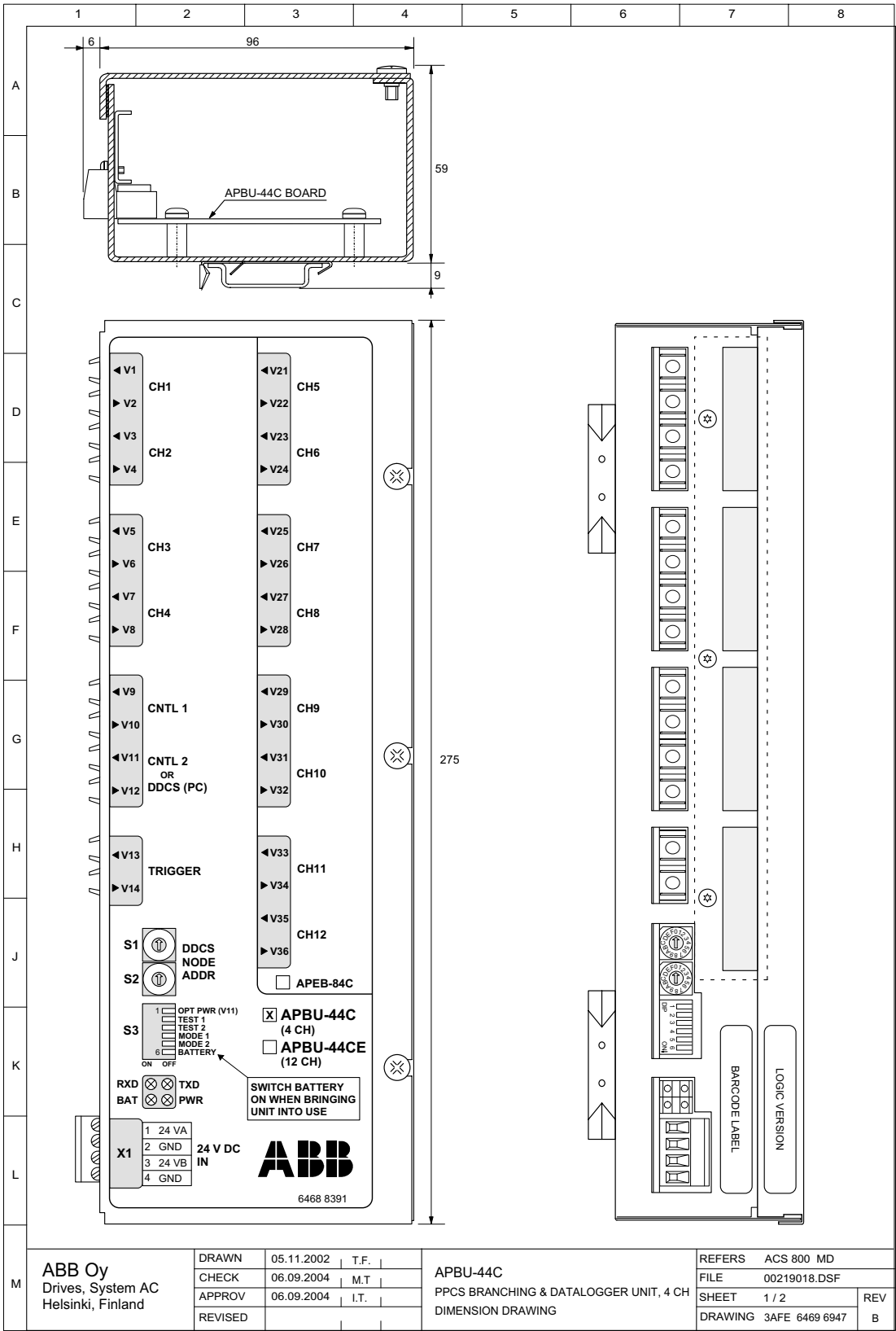


NPBU-42C branching unit



64009249-A

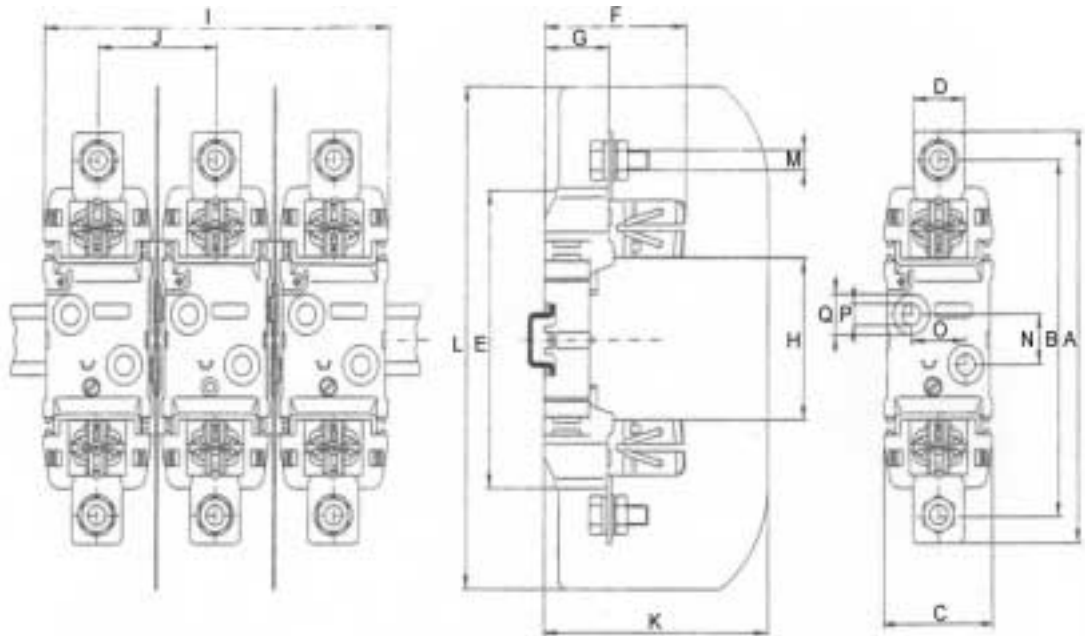
APBU-44C branching unit



64696947-B

Fuse bases

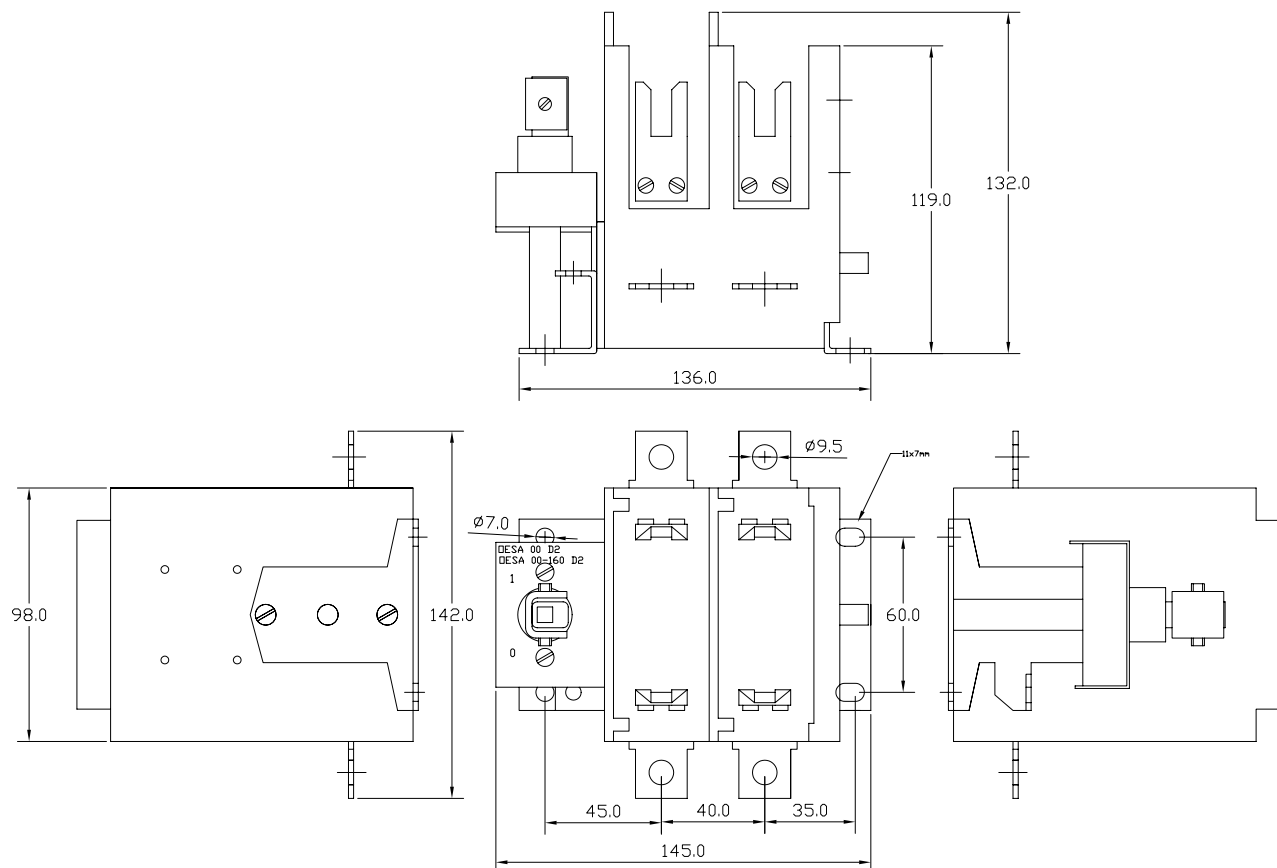
SB series



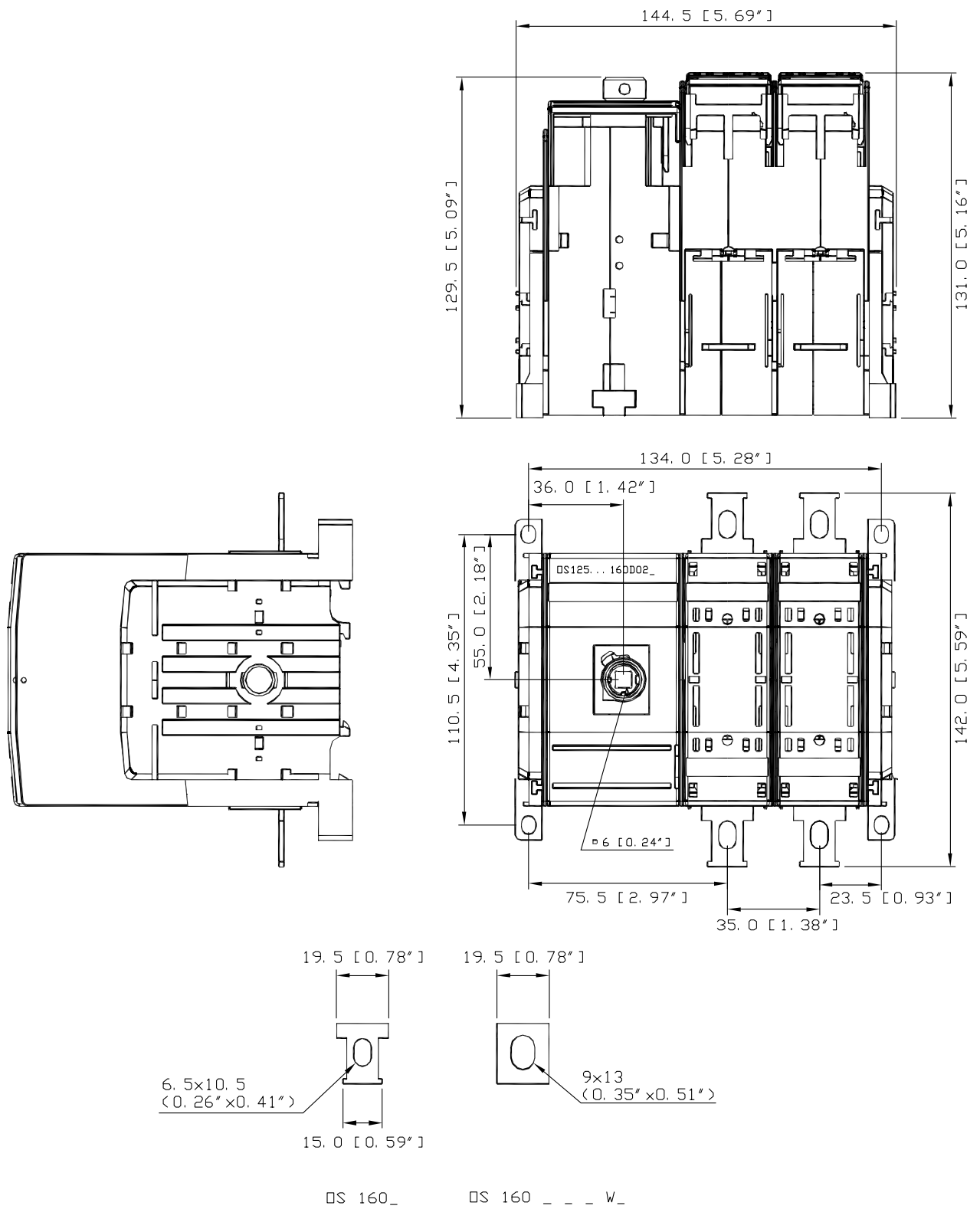
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
SB00-D	120,5	100	37	20	86	58	23	56,5	114	38,5	84,5	146	M8	25	0	15	7,5
SB1-D	200	175	60	28	148	77,5	35	80	192	66	123	250	M10	25	30	10,5	20,5
SB3-D	240	210	60	38	148	97	35	80	224	82	143	270	M12	25	30	10,5	20,5

Switch fuses, charging components

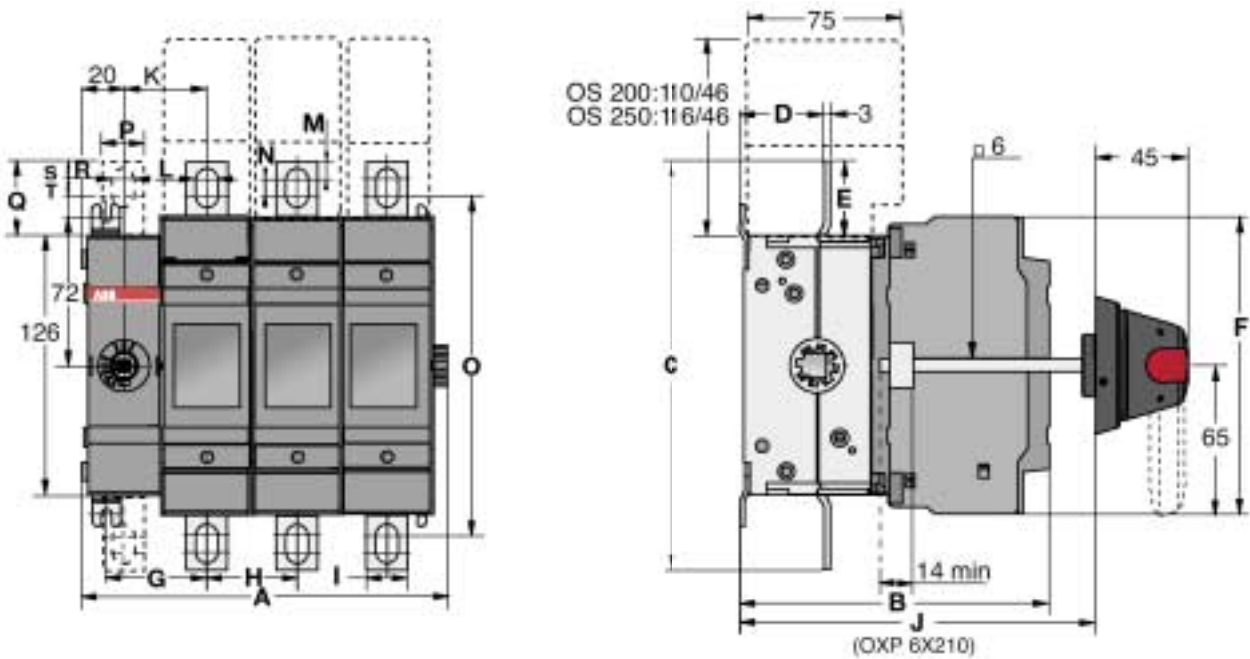
OESA00-160D2PL



OS160D02

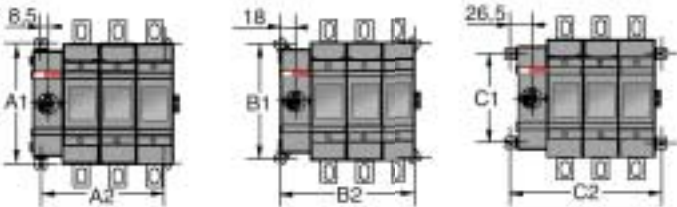


OS250D02P



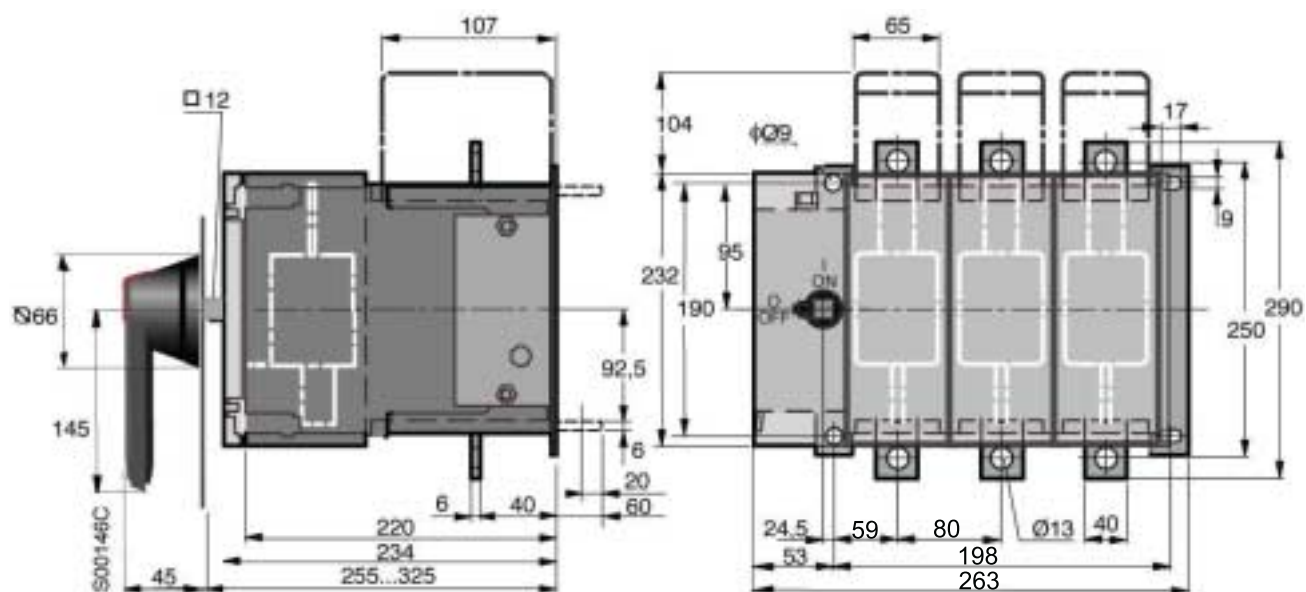
	OS200								OS250			
	D01	B01	D02	B02	D03	B03	D04	B04	D01/B01	D02/B02	D03/B03	D04/B04
A	89,5	89,5	133	133	176,5	176,5	220	220	99,5	153,5	207,5	261,5
B	149	130	149	130	149	130	149	149	154	154	154	154
C	198,5	198,5	198,5	198,5	198,5	198,5	198,5	198,5	193	193	193	193
D	40,5	40,5	40,5	40,5	40,5	40,5	40,5	40,5	40,5	40,5	40,5	40,5
E	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	31,5	31,5	31,5	31,5
F	144,5	144,5	144,5	144,5	144,5	144,5	144,5	144,5	148,5	148,5	148,5	148,5
G	48,5	48,5	48,5	48,5	48,5	48,5	48,5	48,5	53,5	53,5	53,5	53,5
H	-	-	43,5	43,5	43,5	43,5	43,5	43,5	-	54	54	54
I	20	20	20	20	20	20	20	20	25	25	25	25
J	180,254	189,254	180,254	189,254	180,254	189,254	180,254	189,254	189,254	198,254	189,254	198,254
K	40	40	40	40	40	40	40	40	45	45	45	45
L	10	10	10	10	10	10	10	10	11	11	11	11
M	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	11,5	11,5	11,5	11,5
N	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	4	4	4	4
O	164,5	164,5	164,5	164,5	164,5	164,5	164,5	164,5	162	162	162	162
P	20	20	20	20	20	20	20	20	20	20	20	20
Q	33,5	33,5	33,5	33,5	33,5	33,5	33,5	33,5	33,5	33,5	33,5	33,5
R	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5
S	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4	8,4
T	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6	8,6

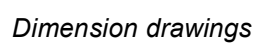
OS_N3

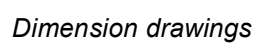


	OS200				OS250			
	D01/B01	D02/B02	D03/B03	D04/B04	D01/B01	D02/B02	D03/B03	D04/B04
A1	144	144	144	144	144	144	144	144
A2	60,5	104	147,5	191	70,5	124,5	178,5	232,5
B1	136,5	136,5	136,5	136,5	136,5	136,5	136,5	136,5
B2	75,5	123	166,5	210	85,5	143,5	197,5	251,5
C1	108	108	108	108	108	108	108	108
C2	96,5	140	183,5	227	106,5	160,5	214,5	268,5

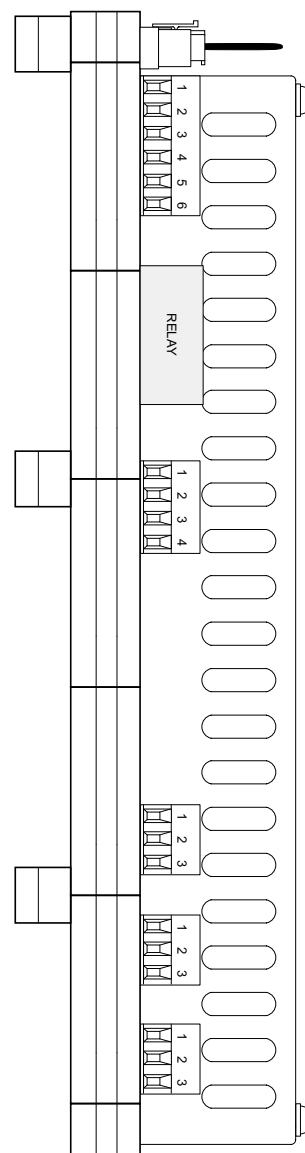
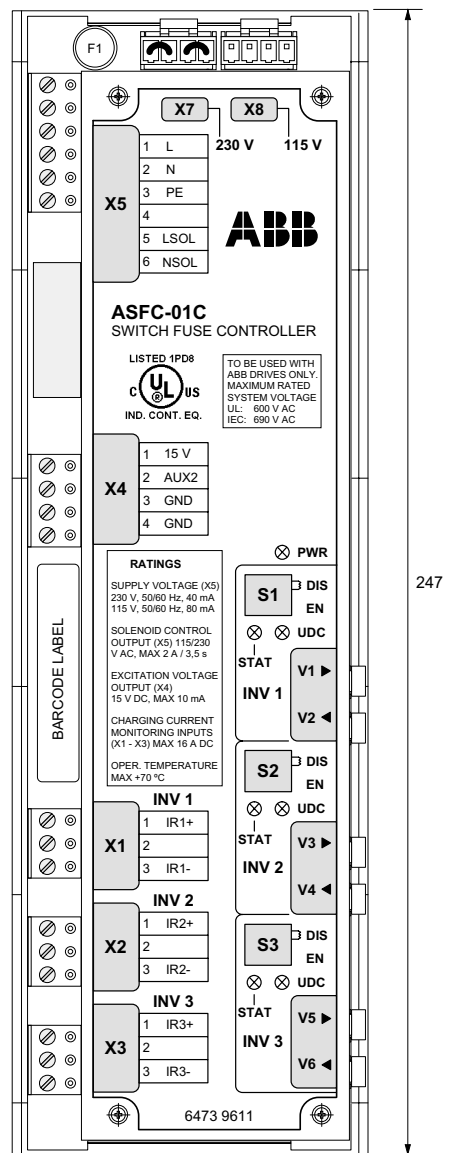
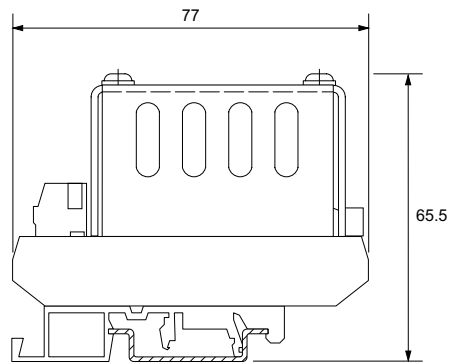
OESA630D2PL





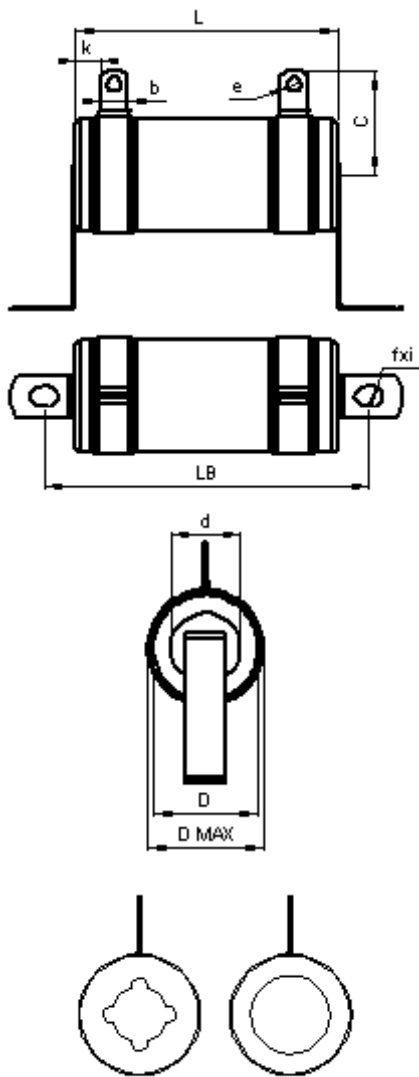


ASFC-01C switch fuse controller



68222966-B

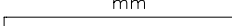
ZRF charging resistors

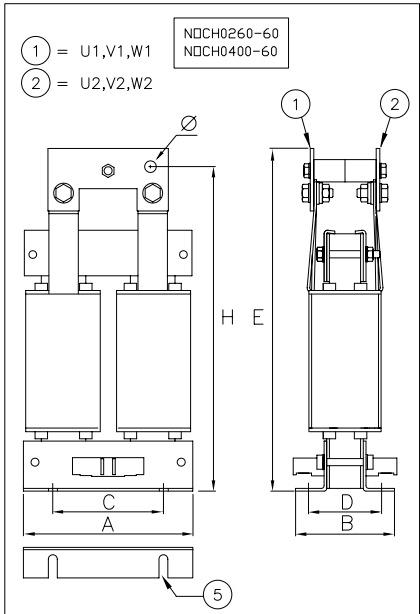
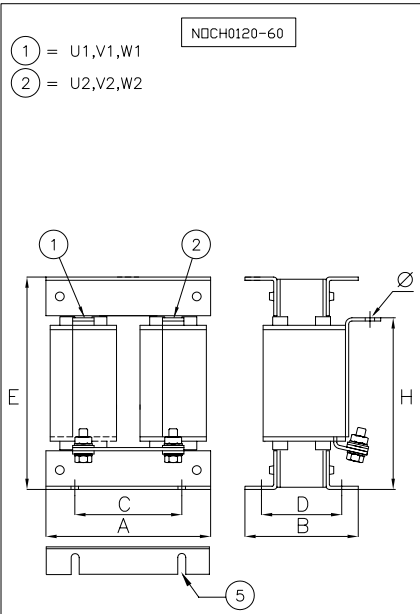
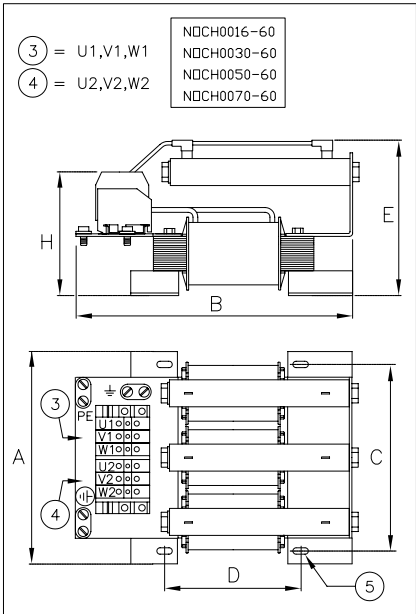


Type	L	LB	fxi	D MAX	k	e
ZRF 30×165	165 ±3	183	5.5 × 8	34	6 (min.)	4.2
ZRF 30×167,5	167.5 ±3	185.5	5.5 × 8	34	6 (min.)	4.2

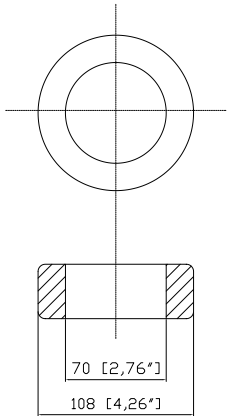
Diverse

Output (du/dt) filters

L2	mm 						① ② Ø	kg /1	⑤ ① ② Nm 	③ ④ mm²	Nm 
	~	A	B	C	D	E	H	mm	kg	→ Nm	mm² → Nm
NOCH0016-60	140	195	120	85	115	83	—	2.4	M5	4	0.2...10 1.5
NOCH0030-60	165	215	145	108	130	95	—	4.7	M5	4	0.5...16 1.5
NOCH0070-60	180	261	170	125	150	120	—	9.5	M6	6	10...35 2.5
NOCH0120-60	154	106	100	75	200	160	9	7	M8	20	— —
NOCH0260-60	185	111	124	82	383	368	13	12	M10	30	— —
NOCH0400-60	185	126	124	97	383	368	13	17	M10	30	— —



Common mode filter toroids



PDM-58368-B



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